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The Scottish Pre-Celtic Heritage

By ROBERT H. S. ROBERTSON

Thanks mainly to National Blood Transfusion Services the frequency of the four blood groups O, A, B and AB has been calculated for local populations in many parts of the world. Blood group O, for example, exceeds 70 per cent of the population in the Basque country, Liguria, Corsica, Sardinia, parts of north-west France and the north of Wales, all Ireland and Scotland, Iceland, Lapland, two areas where the Tuareg Berbers dwell, and in the Caucasus in the mountains around the line from Batumi to Tbilisi. The distribution of these genes has been mapped for Europe by Mourant *et al.* (1958), for Britain and Ireland by Lundman (1962), and for the North of Scotland by Brown (1965).

In a polymathic review of genetics and prehistory Sir Gavin de Beer (1965) brings together the evidence of recorded history, blood group incidence, the ability to pronounce *th* (after Darlington 1947), place names and linguistics, archaeology and cultural relics to provide a vivid picture of the remaining signs of the former neolithic Mediterranean people. In the present essay I am bringing together some observations on the pre-Celtic civilisation of Scotland.

The O blood group in the western periphery of Europe is associated with the Atlantic race, who were largely the megalithic people. An object of this essay is to see if there are any signs of these people in the present or recent Scottish cultural and genetic heritage. By way of introduction it may be helpful to say that as blood groups are less susceptible to selection than phenotypic characters they represent the ancient and prehistoric ethnology of the stock, even when this has undergone change in outward appearance. Thus it has come about that the broad-skulled Basques, who are nevertheless related originally to the Atlantics, show their affinities in the high incidence of blood group O. The high O in Iceland is due primarily to settlement from western Norway, where there were Atlantic elements which had been culturally Gothonicised, and to Irish Gaelic elements who were absorbed by these Norse of Atlantic but not Nordic origin. The latter brought with them people from the Western Isles of Scotland as long as the Norse connection persisted, thus maintaining the influx of the O group.

Published isogen maps show that, with the exception of a few small areas, Scotland has an O blood group incidence of over 70

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per cent and the Highlands have less than 25 per cent A. Low B frequencies occur in the Outer Hebrides and the mainland opposite; but the high B frequencies occur in Orkney, Caithness and Easter Ross, and in some unexpected patches on the west coast of Sutherland, in the Strathglass-Beauly-Abriachan area and in the area to the east of the Great Glen. Brown (1965) correlates the high B group of these places with the distribution of neolithic chambered cairns built by people who began to arrive in Scotland, it is believed from Iberia, from about 2000 B.C., though de Beer would have expected such people, like the Basques, to have very low B. Until the arrival of a few Iron Age people in the last centuries B.C. and the Scoti from Ireland in the fourth and fifth centuries A.D. the only other important group of immigrants were the Beaker Folk, from about 1800 B.C. They settled mostly in the east of Scotland; some lived along the Moray Firth but only a few went further north.

These studies show affinities between the Q-Celtic speaking peoples of Ireland and the Scottish Highlands and the P-Celtic peoples of Strathclyde and North Wales. The people of mid- and south Wales, though they may still speak their P-Celtic language, have far stronger affinities with the Midlands of England than with Scotland or with Ireland, so it is misleading in some contexts to speak of the Celtic peoples as if they had much in common. High incidence of blood group O correlates only with the area of the Q-Celtic speakers.

It is clear from these observations that the Welsh are mainly a Celtic people speaking a Celtic language. That is why they love their language and preserve it more successfully than the Scots or Irish who are essentially pre-Celtic peoples by whom the implanted Q-Celtic language has never been so firmly accepted. A major contribution by Irish and Hebrideans to the colonisation of Iceland has been suggested by Mourant (1965) to explain the higher percentage of O genes in Iceland than in modern Norway, whose population must have entered the country mostly after 1000 A.D. Doubtless many Hebrideans spoke and wrote in Old Norse.

According to Professor W. J. Watson, Pictish was latterly substantially a P-Celtic language, but there is no doubt that it gave way rapidly to the conquest by Gaelic in the Highlands. Perhaps the quick collapse was due to the survival of pre-Celtic (possibly Hamitic) elements of speech and culture, so that the Celtic, well ingrained in the Celtic conquerors of the people of Caledonia, may never have taken well among the original population whose speech origins were already so mixed.

It is fair to comment that languages can be forced on a country by a minority and do not sensitively reflect the degree of miscegenation which has occurred through immigration and conquest. We can compare the situation in Kuching, Sarawak, for example,

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where civil servants of native origin have been speaking English for the last 20 years and might have to change to Malay if Malaysia proves to be a stable community of nations. There is the possibility that they might speak three languages in 30 years.

Nevertheless we can be sure that before the arrival of the Iron Age Celts there were in Scotland people speaking non-Indo-European languages. As de Beer points out, Columba needed an interpreter to converse with the Picts. The place names *Caledonia* and *Graupius* (now the Grampians, among which this paper was written), *Schiehallion, Rohallion* and *Dunkeld,* and a dozen of Ptolemy's river names as well as *Isla, Affric, Liver* and *Nevis,* are non-Indo-European—as are some names in Ogham insciptions, and the strange names of Pictish kings, such as *Bliesblituth, Usconbuts* and *Canatulachama.* Moreover, the matrilinear succession of the Pictish kings was of pre-Indo-European origin, as it was among the Etruscans and the kings of Rome, many of whom were Etruscan and non-Indo-European. Not one of them was succeeded by his son; most were succeeded by the son-in-law or by the mother's grandson. The system seems to have been general in the Mediterranean in neolithic times and the Lemta Tuaregs still preserve it; and among the Basques today lawyers pay particular attention to property inherited from the mother (de Beer). Some of the features of Scottish law relating to the social position of women still reflect their greater importance than in the south.

Cecil Curwen (1940) counted the number of pentatonic, hexatonic and heptatonic melodies occurring in the folk music of many nations. He found that of the 241 melodies in Mrs Kennedy-Fraser's *Songs of the Hebrides* 46 per cent are pentatonic and 33 per cent are hexatonic. Of the pentatonics in this collection 18 per cent have a compass not exceeding five notes—a feature which connotes antiquity. Most of these songs were collected in the Outer Hebrides and in Eigg. The proportion of the three types of melody are given here in the form of a formula: thus, Miss Frances Tolmie's collection coming mainly from Skye has the proportions 38:50:12; of the pentatonics 14 per cent have a restricted range. A general collection, *A' Choisir Chiuil,* not exclusively from the islands, has 41:37:22, with only 4 per cent of small compass pentatonics. Finally, out of 336 Scottish songs with English words he found 31:33:36, with no restricted pentatonics. Thus he found evidence of a strong and active pentatonic tradition in Scotland, showing progressive diminution in the proportion of restricted-compass melodies from 18 per cent in the outer islands to none in the Lowlands. Thus, the extreme conservatism of the islanders has preserved the ancient melodies. Tunes of this kind are indeed still being composed. The figures are repeated in the following Table in which the songs of other countries are compared.

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Country	Number of Melodies	Penta-tonics	Hexa-tonics	Hepto-tonics	Others	Pentatonics of small compass
Scotland						
Outer Hebrides	241	46	33	21		18
Inner Hebrides		38	50	12		14
Highlands		41	37	22		4
Lowlands	336	31	33	36		0
Ireland	1500	13.5	34	52.2		4.5
Wales	312	1	32	67		0
England	169	4	20	76		0
Brittany	60	3	28	67	2	0
France	60	5	40	33		0
Basque country	48	4	25	67	4	0
Lapland	848	67	30	2	1	0
Finland, secular	100	9	25	66		0
Finland, religious	112	0	34	66		0
Iceland	20	5	20	75		0
Faroe Islands	100	8	54	38		0
Norway	100	4	50	46		0
Sweden	50	0	46	54		0
Russia	100	2	50	48		0
Germany	100	2	15	80	2	0

There were no pentatonic songs to be found in Spain and Portugal, Italy and Sicily, Austria, Hungary, Czechoslovakia and Poland, but there were 2 per cent in Greece (2:32:55: others 11). However, in the northern group we note a heavy concentration of pentatonics in the extreme north (Lapland), fringed by a moderately strong pentatonic tradition in Finland, the Faroe Islands and perhaps in north-east Russia. They also predominate among the music of North American Indians (7 out of 9), among whom the incidence of the O gene is about 95 per cent, among ancient Eskimo tunes (18 out of 32), and among Negro songs (83 out of 209). Doubtless this is the origin of the rather high value found in the songs of the U.S.A. (15 out of 32).

It is probably helpful to recall that the O blood group of the Amerindians is linked to the O which is peripheral to the Mongoloids as a whole. The outer ring of Mongoloids are O rather than B. The Lapponoids would fall into the same outer ring of Mongoloids with, of course, some Caucasian intermixture in some cases. Even among the Amerindians there are also some Caucasian

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elements and these are mainly of Atlantic origin, though later Nordic elements were received.

As Curwen puts it: "In Europe the few surviving pentatonic areas are on the extreme fringes of the north and north west, including Lapland, Scotland and Ireland" (de Beer gives a map showing these areas in relation to the centres from which man's civilisations began. They represent the longest distance from these centres). It is generally recognised, Curwen continues, that the five-note scales are earlier and more primitive than the 6- or 7-note scales. At the pentatonic stage of development the ear has not yet learned to distinguish or appreciate the semitone which inevitably appears when the "gaps" are filled in.

> . . . the spread of the heptatonic scales at the expense of the pentatonic is a measure of the spread of musical instruments such as the harp, lyre or flute and that the heptatonic distribution corresponds roughly with the spread of the Indo-European and Arabic languages.

The earliest known flutes were heptatonic and tuned to the Lydian mode. The Sumerian flute dates from the third millenium B.C.

Curwen concludes that

> Down to the Late Bronze Age therefore, we have reason to suppose that Scotland, Ireland, and part of Wales were occupied by a more or less homogeneous culture-group that was in the main descended from the old megalithic stock. . . . It is difficult to resist the conclusion that the pentatonic tradition is a legacy from the pre-Celtic Picts, and that the latter, whatever their language may have been in historic times, represented the old megalithic stock blended, no doubt, with Beaker and other Bronze Age elements.

As we have in this Scottish musical tradition a living pre-Celtic tradition we may ask whether other cultural traits also come from the same source.

In the north-west Highlands and in the islands, in the crofting districts, we find a classless society. One feature of this is that any man may marry any girl. There are no social barriers, as between working class and upper class elsewhere. There is no social assortative mating as is usual in Western European civilisation. I do not include the landowners or even the Highland chiefs because they have married southern wives for so many generations now and may have been a Celtic or even Norman ruling class for centuries.

Another remarkable—and ancient—feature of the Highlander

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is that he has not yet accepted division of labour. Until recent times every crofting family carried out the same household and agricultural operations: basically, they wove their cloth, made their clothes and shoes and grew their food. They co-operated to run boats and to some extent in food raising, but the few who took up a trade tended to become *déraciné*. We still see how the Highlander who becomes a merchant has to join the southern economy and civilisation and no longer enjoys the full acceptance of the undifferentiated population around him. At worst he is really disliked for having opted out of the old civilisation.

We cannot say that the Highlander of today is clearly aware of his substantially pre-Celtic civilisation. Crofting has become associated with a system of subsistence farming and the ownership of a house. Crofters are protected by special laws and by the Crofters Commission, who are trying to enlarge crofts to remuneratively large acreages, or to find ancillary occupations when croft lands cannot be extended. Doubtless it would be helpful if crofters realised that they belonged to an ancient civilisation, so distinct from the rest of Europe that one would have to go to Iran, say, to find another so different. The human management of Highland affairs depends largely on recognising this extreme difference in cultural pattern. We could say that the Highlanders have more in common with the Basques than with the Saxons!

The present social structure of the Highlands, of course, does not reflect its historical antecedents, so we must not be misled by what can be observed today. The result of Scottish aggression, culminating in British aggression in 1746 and immediately thereafter, destroyed the character of the Highland society. This consisted of a chiefly line (of Celto-Norman origin), a related class of the same stock forming lesser gentry and farmers of some standing, as well as the associated craftsmen, and below them a peasantry which was basically Atlantic. The Reformation began the process of striking out of the stock a part of the originally hereditary learned classes in the various forms of priesthood. The later destruction of the Clans certainly involved all classes, but the cleanest sweep was made of the middle stock which was Celto-Germanic. The Clearances affected the peasantry: those who were left behind tended to be of ancient Atlantic stock, the more advanced classes having been largely eradicated. So it comes about that we have a society which is still largely Atlantic in outward and visible form though it is also heir to some of the culture of the former but now largely extinguished conquerors.

As David Lilienthal (1944) said, regional "development envisioned in its entirety could become a reality if and only if the people of the region did much of the planning, and participated in most of the decisions." These words will undoubtedly inspire the newly formed (1st November 1965) Highlands and Islands

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Development Board, but it is fair to point out that the whole of the Highlands, 78 per cent of the area of Scotland, has no University or seat of higher learning or research, and the people themselves have little knowledge of their origins or how their culture might be strengthened to play an effective part in the changes which will soon take place.

Fraser Darling (1955) pointed out that the social life of Gaelic speakers, in Lewis for example, is intense and hardly appreciated by outsiders whose presence cools the party often to the point of polite dullness. One of the Highlanders' mechanisms for protecting his civilisation is to hold the European at arm's length or further if he can. He extruded Lord Leverhulme; he resists many forms of exploitation; and he often makes a fool of Government subsidies. Yet he is afraid that the southern way of life may prove too strong for him. He does not know how to resist the supposed ill effects of complete absorption by the Indo-Europeans; and he has no leadership since the chiefs have joined the southerners in their ways. This is the background of the most difficult problem of regional development in Europe.

It is easy to misjudge a people who are living in an ancient manner, whether they be Australian aborigines or Scots. Highlanders have been regarded by others as savages—lazy, worthless people. They have been ruthlessly hounded by the military; they have been evicted and replaced by sheep and deer; and even today doubts linger in some minds about their ability.

Fortunately, however, it is possible to compare the creative ability of people bearing different surnames. Nathaniel Weyl (1961) has counted the numbers of many Highland names in the U.S. Social Security roll—a list of all adults for defence purposes. The proportion of these names to the total is then compared with the proportion to the total of the same names in various books of reference, such as *American Men of Science,* Volumes I to III, or *Who's Who in America.* From these figures a performance coefficient is derived. Now if the Highland people were really of poor and worthless stock, Mackays, Gunns, Macphersons, Macleods and so on would be expected to have low ratings. In fact the ratings are quite high. Taking *American Men of Science,* for example, clan names typical of the Western Isles and West Coast have a performance coefficient of 129; Central Scotland, 149; East Scotland, 165; Strathclyde, 130; and the Borders, 116. The value for English names is about 115. The differences in these figures are believed to be significant, and we may infer that Highland people come from a stock which is rather more creative than the English, for example. The differences between the different areas are also significant and will be discussed elsewhere, but it is safe to say that this ancient stock was bright and creative. The present population may have suffered from selective emigration, but to what extent we

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cannot say. Like the Etruscans, the Highlanders seem to fare badly at the hands of the violent and aggressive Indo-Europeans—it is striking how few Highlanders resisted the cruelties of the evictions. They just walked away bitterly into exile.

Although warlike, the Atlantics have always retreated before positive aggression successfully maintained and organised. It is fair to point out that the easy retreat of the "Gael" by emigration overseas during the Clearances especially is in marked contrast to the normal behaviour of the Scots, who definitely are aggressive. We should distinguish between the Scots who are Celtic-Gothonic-Teutonic and the "Gaels" who are really pre-Celtic in origin—that is, Atlantics with a veneer of Aryan Celtic, Norse and Norman. The Scottish character depends on the former rather than on the latter.

Perhaps I should say that the deep difference of Weyl's performance coefficients became apparent when he studied the common English clerical names, *Clark, Clarke* and *Palmer,* amounting to over 386,000 of the 117 million names on the Social Security rolls. Now, about the time of the Crusades, when surnames were beginning to be formed, some of the brightest young men who had been to the early Universities were forming the literate classes. Some entered the Church and became Clerks in Holy Orders, but others would be come known as Johnnie le Clerc, or perhaps—if he were also a pilgrim, often from the literate classes—Richard le Palmer. If this kind of brightness were genetically inheritable and if men inheriting this kind of brightness had the instinctive knack of marrying the right kind of woman, then we would expect that even after 700 years this English clerical surname group would still show high performance coefficients; and Weyl found that it is indeed superior. Its performance coefficient was 153 in *Who's Who in America 1955-57*; 186 among physical, 194 among biological and 186 among social and behavioural scientists; 147 in the *Directory of American Scholars*; 234 in *Poor's Register of Directors and Executives*; and 175 among U.S. engineers. As Weyl remarks, the superiority of this group was not very marked among army officers (128) nor among bureaucrats (120 in higher-level State Department jobs): as he says, where security is preferred to rigorous competitive struggle and where conformity is rewarded more than creativeness.

This work gives substantial proof that creative ability is to a high degree inherited and that the Highlanders are just as likely to do well in life when opportunities are available. The very high incidence of creative people in Buchan (East Scotland, roughly Aberdeenshire) may be due to selective breeding among a fundamentally good stock. I am inclined to think that the ancient stock predominates there also and that Buchan genius owes less to Indo-European genes than has hitherto been supposed.

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That the megalithic builders of ancient Britain could predict movements of the moon and even eclipses was made clear by Professor G. S. Hawkins (1964), who showed that Stonehenge was a lunar observatory of considerable complexity. Professor Alexander Thom (1964) has shown that at other megalithic sites there were observatories, such as at Loanhead Daviot in Aberdeenshire. In a previous paper Thom had shown that the builders of stone circles in Britain had knowledge of geometry including Pythagorean triangles, such as in the northern ring at Clava near Inverness. Archaeological evidence, then, is suggesting that the late neolithic inhabitants of Scotland had among them some highly intelligent people. Archaeologists are inclined to the view that megalithic monuments were erected by local groups and that the inspiration to build them came from the Mediterranean; but the people who were concerned with this current of culture were Atlanto-Mediterraneans and not Aryans. Moreover, it cannot be assumed that the incoming of large numbers of Indo-Europeans has been or would be a blessing.

Incidentally, the megalithic yard, which was used in constructing the stone circles, was 2.72 feet or 0.863m in length. A measure of this length, the Vara, lingered in Spain, and it is also known in South America (de Beer 1965). Whether it went there with the neolithic colonists, high in blood group O, or with the Spaniards, it is not known.

It is clear from this survey that the substantially neolithic stock is an important element in Scotland's heritage and a vital one in the Highlands. Long-continued emigration—now running at 40,000 a year—has been and is harmful (Robertson 1960, Clement and Robertson 1961), but the provision of new opportunities for exercising creative ability is now a vital necessity in Scotland, greater even than the provision of jobs by the attraction of industry from more prosperous parts of the world. While the pre-Celtic culture is still active in the Highlands, it still affects the life of the Lowlands to some extent. It is of course impossible to govern well people belonging to two different civilisations from one centre, namely London, and the sooner that rulers pay heed to genetic and to cultural history the better for the Scots. Perhaps when there is a European community of nations the Basques and the Irish and the Scots will be allowed to make their own particular contributions. At the moment only the Irish are free to join.

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SIGNIFICANT EVIDENCE ON INHERITANCE AND HYBRIDISATION

By G. PANTEL

PART II

From the observational and experimental evidence referred to in Part I of this article it is clear that both the ultimate mode as well as the direction of the evolutionary process is now apparent. Evolution is immutably directed towards upbuilding of the ability of a specific or sub-specific group of living beings to survive, whose resources for survival depend largely on the structural, morphological, functional and behavourial characters peculiar to them. The pattern of evolution observed (selective survival mating; natural selection; largely random segregation and recombination of alleles; rare, relatively random mutations in individual genes and more rarely, if at all, occurring adaptive ones) ensures that minute structural and functional advantages are given a slender chance to be selected after they have been tested over vast periods of time, so that when selected they may account for the maximum possible amount of specific ability to survive (in living ability units).

DEVELOPMENTAL GROUPING

These time tested minute advantages, then, the interacting groups of DNA molecules thus advanced structurally and functionally by the complementary effect of four distinct modes of human development over vast periods of time, are our heritage.

Perhaps the following observations concerning developmental grouping may be referred to and profitably stressed here.

1. Man is bound by his heritage forever to share a human social life and thereby forever to face the environmental interferences human agency presents. Man's heritage and the direction and the mode of human development, as presented here, determine that the man necessarily sharing social life is born, survives, or fails, as a member of a distinct group. Of course, the basic social life interaction involving differential individual activity and exchange of means and services is established largely by consensus arrived at after sharing of common experience. However, this interaction is frequently, as a direct consequence of developmental grouping, somewhat balanced in favour of the group proven as

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most able to survive by the outcome of a decisive inter-group contest; with the result that there is always a group exercising some control over others. Consequently, while the modified natural environmental influences presented by other than human agency have a comparatively reduced significance for survival in social life, environmental interferences presented by human group agency often spell a vast quantitative change in the ability to survive which any inherited unit gene interaction or any developed heritable unit character may hold in any individual man.

2. With reference to the present stage of man's evolutionary progress and largely in consequence of his developmental fate forever to share social life, mental unit characters, such as intelligence, specific abilities, memory and capacity for learning, behavioural characters, and a variety of specific tendencies, characters which may be understood to comprise mental as distinct from physical capacity, not only count predominantly for man's ability to survive, but also represent the major field in which man is likely to evolve further.

3. The grouping of men resulting from the immutable direction maintained by four distinct modes of human development is two-fold.

(*a*) A group of men is often thought and readily understood to form a race when each member of the group (i) shows an appreciable majority of an adequate number of strikingly—by sharp contrast—recognisable and predominantly behavioural, craniometrical, morphological and pigmentary unit characters, and (ii) carries the unit gene interactions responsible for the development of these unit characters in a homozygous state. When a number of the members of such a race group show an appreciable majority of a number of such characters which are inadequate and of insufficiently sharp contrast for a major race distinction, while both the number and nature of the characters concerned, as well as their contrast, present a significant enough and pure-breeding racial variation, such members of a race group are often thought and readily understood to form a sub-race.

(*b*) Men who belong to a group described under (*a*), to a race or to a sub-race are classifiable under a number of different groups, the members of which (i) show each an appreciable majority of an adequate number of contrasting, though not readily discernible, and predominantly mental unit characters accounting for a considerable difference in ability to survive, and (ii) carry the unit gene interactions responsible for the development of these unit characters, not necessarily all in a homozygous state. These groups of men found within a sub-

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race or race are, of course, also produced by the complementary effects of the four modes of evolution, the mode of the inherent tendency of selective mating appearing to predominate. From relevant observations we can expect that thus classifiable members of the higher of such groups carry at least over 50 per cent, indeed an appreciable majority, of the unit gene interactions responsible for the development of the distinguishing unit characters concerned in the homozygous state. Consequently, the higher groups thus distinguished are but strictly racial variations within a sub-race or race and can therefore be appropriately called "intra-sub-racial or intra-racial variation groups." Neither the number or nature nor the contrast of the distinguishing unit characters concerned would allow for a sharp definition of such intra-racial or intra-sub-racial variation groups. Such groups can only be quantitatively defined by the difference in ability to survive for which the distinguishing unit characters account, so that a fixed range of such differences classifies members as belonging to one such group. Depending on how the ranges concerned are fixed, these intra-racial or intra-sub-racial variation groups will, of course, be more or less likely to be identified with the classes customarily distinguished on account of social position and status—higher, middle and lower—since a positive correlation is likely to obtain between the two scales. The latter scale, however, will always remain a social one, while the former is a strictly developmental scale involving hereditary transmission and the significance of evolutionary progress that goes with it. At least, we can have no doubt that the kind of races thus distinguished, which the higher intra-racial and intra-sub-racial variation groups actually are, are worthy of consideration in developmental terms, that is, with regard to the progress of the evolutionary life process.

4. The distinction of the so-called three major races, white, black and yellow, as well as that of any sub-races, is only worthy of consideration in developmental terms—that is, with the regard due to evolutionary progress—if the number, the nature and the contrast of the unit characters—see under 3 (*a*)—and of the underlying unit gene interactions, by which the three major races or any sub-races are distinguished, account for a considerable difference (about 10 per cent) in ability to survive in the face of all possible environmental interferences. This difference can be determined, in living ability units, by experiment. The amount of actual living ability a number—a representative sample—of members of one major race or sub-race possess on average, when exposed to a given range of environmental interferences, can be experimentally ascertained and then compared with the actual living ability

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amount an equally representative sample number of members of another major race or sub-race are found to possess on average in the face of the same range of environmental interferences. Even if such a determination could be carried out with an accuracy satisfactory to a disinterested scientific forum, the results can only be expected to remain subject to criticism from one side or the other, according to their significance in such an issue. Accordingly, we may assume that the assessment of the difference in question, and consequently the significance of the distinction of races or sub-races, with regard to the evolutionary progress in genetical terms, is likely to remain a matter of opinion to some extent.

5. It is not without evolutionary significance that apart from the grouping of men as determined developmentally a quite effective grouping is brought about in a different way, namely, by way of common faith, whether ideological or religious, or even by way of common interest. Evidence of many a developmental factor having an effect on the membership of some faith group or other is not always obtainable. Developmental factors may not be the primary ones to grow and mould a common faith. Any grouping faith, though, whether sound or otherwise, and however dressed, is ultimately a faith in human development and invariably exerts an influence on it which may be positive or negative.

6. A distinction of sub-races solely on account of a shade of variation in pigmentary characters, such as colour of eyes, skin and hair, is not tenable in developmental terms. Such a distinction is out of place because the shade of variation in melanin concentration called upon to account for, rather than indicate, a sub-race distinction, by itself, is very unlikely to carry any considerable difference in ability to survive. Yet a shade of variation in pigment is readily noticeable, so that such a distinction of sub-races, however unwittingly made, can prove an element effectively dividing a genetically homogeneous sub-racial developmental group. The following observations with reference to the so-called Nordic race may serve as an illustration of this.

It has been found that in the southern parts of Europe there is an abundance of cases in which families, as far as can be checked, show prominently the behavioural, craniometrical and morphological characters distinguishing the so-called Nordic race, while their skin, hair and eyes are more or less dark. No indication of hybridism can be traced or assumed in the great majority of such families. These cases—occurring with the frequency with which they do—can only be explained if we accept that people of the same (here the Nordic) sub-race undergo evolutionary adaptation modifying their heritable pigmentary characters and producing a pale skin, blonde hair and grey, hazel or blue eyes in the north of Europe and variations of darker skin, hair and eyes in the

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south, in accordance with exposure to sunlight. How many centuries old are the Greek and Roman statues? They do not show pigmentary characters, at any rate. As to the behavioural ones there is, of course, some evidence in writings and lasting cultural performance, on which one may or may not choose to rely. The morphological characters all of these statues show, however, are unmistakably common to both the people to whom we referred above, showing the dark pigmentation in the south of Europe, and those with little pigment in the north.

If this evidence be found satisfactory, it would be appropriate (*a*) to disregard entirely the pigmentary among the characters distinguishing the Nordic sub-race; (*b*) to rename it, say, the "Euroid" sub-race; and (*c*) to recognise the subject who shows the behavioural, craniometrical and morphological characters of the Nordic sub-race predominantly, bar the common minor variations, to be of the Nordic or Euroid sub-race, no matter what the shade of colour variation of his skin, hair or eyes may be.

No distinction of any sub-races should be adhered to unless it fulfils the following three requirements, which are, of course, the same minimum requirements any race distinction must fulfil:

1. The number, nature and contrast of the unit characters distinguishing a sub-race group must present a significant difference (about 10 per cent) in ability to survive in the face of all possible environmental interferences, when compared with the contrasted characters of the members of another such group.

2. It must be well known that the members of any two contrasted sub-races, when in free contact under conditions allowing uninhibited association, exhibit a spontaneous tendency to segregate resistant to any measure of reasonable advice in favour of integration.

3. The members of the sub-race group concerned must be known to carry an appreciable majority of the unit gene interactions responsible for the development of their distinguishing unit characters in the homozygous state.

These three requirements are necessary for two major reasons: (i) The only indication—accountable in developmental terms—of a justification for the distinction of races and sub-races is to guard against any possible retardation of the evolutionary process by hybridisation and, perhaps to a lesser degree, to guard against possible adverse effects the association of a given group with another may have on the social life variant either group may have evolved. (ii) Hereditary values are, of course, appreciably significant and are commonly viewed with a sense of awe. People of any kind are more or less capable of emotionally augmenting any racial conception as well as the importance of any alleged racial distinction. Therefore, where the above three requirements are not

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fulfilled and no retardation of the evolutionary process by hybridisation can be expected, the publicised declaration of an anthopologist's distinction of a sub-race can do but unnecessary harm. Sub-races have been distinguished, for example, on the part of the Eurasian continent that has been from time immemorial geographically described as the continent of Europe. Few, if any, of these sub-race distinctions appear to fulfil the above requirements, although there are a few sub-races, distinguishable in full accord with the above requirements, in each of the three major races.

HYBRIDISATION

All members of a "pure race" or of a "pure line" would be homozygous for all their pairs of homologous unit gene interactions, that is, for all their pairs of alleles, so that any unit character variation among them could only be an environmentally induced one. No such "pure race" or "pure line" exists, though, where genes are subject to mutational change and alleles are recombined in all possible ways, as is the case in sexual reproduction.

A community closely inbred, either as the result of geographical isolation or for other reasons, can be thought to be a relatively pure race, although every member of it is heterozygous for several of his pairs of alleles. It is unfortunate that the heterozygosis resulting from mutational changes and sexual reproduction has so often been identified with hybridisation. Thus resulting heterozygosis necessarily follows the similarly determined increase in the number and variation of combinations of different pairs of alleles in a racial group; but it is misleading to call it hybridisation, so identifying it with the result of the crossing of members of two different species, races or sub-races.

From earlier relevant demonstrations it is clear that the heterozygote with the minimum qualification as a hybrid—if we distinguish, as we have to, between a hybrid and a back-bred hybrid—is the maximally but not fully back-bred hybrid descending from a crossbred from two sub-races distinguished as such in full accord with the three requirements already defined in the preceding section. Accordingly, heterozygotes for several pairs of alleles, who are members of a race or sub-race thus distinguished, do not qualify.

What is now known as the "hybrid vigour phenomenon," and came to support a substantial investment in the maize-growing industry, has been observed in plants and animals, including man, for a long time. When members of two different, more or less inbred, relatively pure lines or sub-races are crossed, the hybrid is often more vigorous than either parent.

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Let us find out when we can and when we cannot expect (*a*) unfavourable recessive alleles to accumulate in the natural population of a relatively pure sub-race or line and (*b*) the vigour of the hybrid to be greater than that of either parent.

In a line where self-fertilisation is the rule, as in wheat, or in a human sub-race where mating of close relatives prevails, the close inbreeding forces unfavourable recessive mutant alleles into the homozygous state, in which they are within a more or less short time eliminated by selective mating discrimination and/or natural selection. Here, unfavourable recessive alleles do not accumulate in the population—the inbreeding purges the line or sub-race stock from unfavourable recessives. When members of two such lines or sub-races cross-mate the hybrid cannot be expected to be any more vigorous than either parent.

In a plant line where self-fertilisation is not the rule, or in a human sub-race where mating of close relatives is ruled out, unfavourable recessives are sheltered from selective mating discrimination and natural selection by their more favourable dominant alleles and accumulate in the line or sub-race population. However, as the line or sub-race concerned does not breed out, the limited inbreeding does cause a number of unfavourable recessives to become homozygous, and as a result the vigour of the members of the line or sub-race involved declines—the decline in vigour probably being due to interaction between different pairs of alleles.

Now—and this is the operative assumption in Shull's suggestion—in *different* lines or sub-races *different* deleterious recessive alleles become homozygous as a result of the prevailing limited inbreeding. Here, therefore, when two thus inbred lines or sub-races intercross, the homozygous unfavourable recessives accumulated in each of them are covered up in the hybrid by favourable dominant alleles coming from either parent. By this process of favourable heterozygosis the vigour of the hybrid comes to be greater than that of either inbred parent. There is considerable relevant evidence in support of this explanation of the hybrid vigour phenomenon.

The more extensive the limited inbreeding in the two lines or sub-races crossed, the greater the number of their unfavourable recessives that have become homozygous in their respective populations, the higher the decline in vigour among the members of either sub-race or line and the greater the vigour of the hybrid when compared with the declined vigour of either parent. This is the comparative result of the process of favourable heterozygosis in the F_1 generation hybrid, in whose progeny the vigour again declines at a high rate whether they breed back or—as they may occasionally do—together with similar hybrids.

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THE TENDENCY OF REACTIVE SELF-RECHARGE

What is actually understood by "vigour" has never been defined. Vigour is a tendency; it is a "central" and vital one. It can best be understood and described as a *tendency of reactive self-recharge*. It varies between a low, hardly operative, degree and an operative high degree. In man this significant tendency is one of the characters comprising mental capacity.

There can be no doubt that vigour, as an operative tendency of reactive self-recharge, as well as a barely operative degree of such a tendency, is a heritable property. It is equally beyond doubt that as a heritable unit property it is developed by a unit gene interaction. Now, if we know of two lines or races exhibiting a high and a low degree of this tendency (of vigour) respectively, and breeding true with regard to this character from one generation to the next, then we would expect the unit interaction determining the development of a high or low degree of vigour to be an interaction of the genes belonging to a particular allele, that is, to a particular interacting gene group unit, or rather to a pair of such alleles. If, on the other hand, we are not satisfied that such lines or races breeding true for vigour exist, then the unit gene interaction controlling vigour must be an interaction between the different pairs of alleles responsible for the development of the various physical and mental unit characters with which vigour is positively correlated. In either case the development of this tendency (of vigour) is determined by a unit gene interaction.

The decline of the vigour of the inbred and the restoration of vigour in the hybrid suggest interaction between both the homozygous unfavourable recessives of the inbred and the favourable dominant alleles, at various loci, of the hybrid; or, on the assumption of a particular pair of alleles controlling vigour, an interaction of either kind of pairs of alleles with the one responsible for vigour.

An operative high degree of the reactive self-recharge tendency (of vigour) is positively correlated with high resistance, somatic growth and reproductive capacity, and with a number of physical and mental outstandingly favourable characters of high living ability value. This correlation permits vigour to be wrongly identified with one or other of these highly favourable characters, as and when the particular character is at issue; thus, vigour is identified with high yield by the maize grower and with mental strength by the scholar.

RETARDATION OF THE EVOLUTIONARY PROCESS

Although unfavourable combinations of different pairs of alleles occur in the inter-racial or inter-sub-racial hybrid, the frequency with which favourable heterozygosis confers the benefit of an opera-

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tive reactive self-recharge tendency to the F_1 hybrid is considerably high. This benefit is reduced and soon disappears in the progeny.

Let us now weigh the developmental chances of the inter-sub-racial hybrid. All that is said with reference to an inter-sub-racial hybrid applies to the inter-racial one as well, only to a greater degree.

If we assume that the F_1 hybrid chooses to breed together with similar sub-race hybrids, the offspring, whose vigour declines, may qualify for higher or lower sub-race hybrid variation groups according to whether the combination of alleles struck in each generation is more or less favourable. They will be able to raise their comparative ability to survive within the limits of the hybrid community. The higher sub-race variation groups would at first be common interest rather than racial groups, and would tend to become more racial in time, since their members would be heterozygous for most of their (predominantly mental) distinguishing pairs of alleles at first. With time they would tend to develop and transmit a great and increasing number of their distinguishing favourable unit characters homozygously. Unfavourable recessives would, of course, accumulate in a hybrid community inbreeding thus.

However, it is apparent that the inherent tendency to breed back into either the parternal or the maternal sub-race prevails.[1] The hybrid breeds back into one or the otner parent sub-race, and appears to barter some of the advantages of his favourable unit characters in the process. Of course, "barter" here implies forfeit of chances of ascending some steps on the intra-sub-racial or hybrid variation group scale. This back-breeding can fairly be accomplished, given time, if adhered to by successive generations.

Thus the hybrid—and the F_1 hybrid in particular—who, as a result (H) of his on balance favourable heterozygosis, is endowed with outstandingly favourable characters and accordingly high resources for survival, enabling him to breed back gracefully should he be so inclined, *has and takes* the developmental chances of reversing the result (H) of his own hybrid birth in his progeny, as he is by his very birth also endowed with the inherent tendency to breed back—the latter tendency of back-breeding being a mere consequence of the law of increasing specific living ability and ultimately a tendency selective for ability to survive. Therefore the F_1 hybrid birth, in itself, is given little chance to prove consistent with the natural law referred to, simply because the hybrid remains subject to it and breeds back as a consequence. On this account it is obvious that hybridisation retards the evolutionary process.

Now, the back-breeding of the offspring of F_1 hybrids into a

[1] G. Pantel, "Significant Evidence on Inheritance and Hybridisation: Part I," THE MANKIND QUARTERLY, Vol. VI, No. 4, April-June 1966, pp. 233-235.

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particular parent sub-race presents a degree of hybridisation of the sub-race population concerned. Here, three major effects of hybridisation have to be considered with due regard to their ultimate developmental significance:

1. The effect of constantly increasing the accumulation of unfavourable, deleterious and lethal recessive alleles in the population being hybridised. The sheltering of deleterious recessive alleles is borrowed capital which has to be—as it is being—repaid, however gradually; since we know that no generous uncle is ever likely to write off such a debt.

2. The effect of increasing the possible number and variation of combinations of different pairs of alleles over and above that prevailing in the population of the parent sub-race concerned. It should be recalled here that there is a significant difference in the average ability to survive which the contrasting pairs of alleles of the two parent sub-races represent; otherwise, the sub-race distinction concerned would not be worthy of serious consideration. The variation of combinations possible, however, does increase in the population being hybridised. This is the effect which is very often emphasised and seriously put forward in favour of hybridisation: "the pool of genes is increasingly varied."

3. The effect of increasing the number of heterozygously developed unit characters involving unfavourable recessives in the population being hybridised. With regard to this effect, it has been demonstrated in a considerable number of cases that the recessive allele is not completely latent. It is apparent that we can no longer expect any heterozygously developed unit character to be the same as when it is homozygously produced. We may expect a heterozygote for a given character to differ in it from the homozygote to some extent, however slight. Accordingly, the unit character produced by the favourable dominant allele sheltering the unfavourable recessive is inferior, in the amount of ability to survive it represents, to its apparent copy developed by a homozygous pair of the same favourable alleles. A difference, however small, between a homozygously developed unit character and its heterozygously produced apparent copy appears to be well in keeping with relevant observations made with reference to dominance. Consequently, the effect of increasing the number of heterozygously developed unit characters involving unfavourable recessives in the population being hybridised can be expected to outweigh by far any degree by which the effect under (2) may facilitate the evolutionary process. It is obvious that the increase in the number of heterozygously developed unit characters involving unfavourable recessives is bound to interfere significantly with every individual mode of evolution. Hybridisation, therefore, cannot fail to retard developmental progress.

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Let us now return and consider the effect of hybridisation referred to above under (2) with regard to its independent developmental significance. Can this increase of the possible hybrid-borne recombinations of allelic pairs in the population being hybridised be at all conducive to evolutionary progress, when considered by itself and independently of the effect under (3)?

A conclusive and satisfactory answer to this significant question can be derived largely from the evidence referred to in this article, as follows.

In an inbreeding genetically homogenous population, favourable new recombinations of non-homologous pairs of alleles, all of which have come to occur predominantly in the homozygous state, tend to become the more genetically transmissible—the way permanent hereditary material is thus transmissible from one generation to the next—the larger the amount of ability to survive the new recombinations confer on the organism. However, favourable new recombinations of non-homologous pairs of alleles that occur predominantly in the heterozygous state, although they may randomly recur in a population, cannot at all be expected to become genetically transmissible before the heterozygous pairs of alleles involved in such a recombination become predominantly homozygous in the population concerned. The chance of a heterozygous pair of alleles changing into the homozygous state is known to become more and more remote as a result of hybridisation. Although it may recur randomly in the population concerned, any new hybrid-borne recombination, however favourable, can scarcely be or become genetically transmissible unchanged from one generation to the next. Consequently, the increase of the possible hybrid-borne recombinations of allelic pairs in the population being hybridised cannot be thought to be conducive to evolutionary progress.

Let us compare the frequency of deleterious new and randomly recurring hybrid-borne recombinations of allelic pairs with the rate of occurrence of favourable such recombinations in a population being hybridised. This relationship is rather obscured by the favourable characters and the vigour abounding in the F_1 hybrid (and still apparent, although reduced, in the F_2 hybrid) as a result of favourable heterozygosis. Nevertheless, the prevalence of the deleterious hybrid-borne recombinations over occasional favourable such recombinations is not entirely concealed from the observer. However, since the evolutionary process is always an adaptive one, and as a race or a sub-race cannot be other than the product of a developmental process continued over vast periods of time and adaptive for survival under the influence of a more or less specific range of environmental interferences, we cannot expect any random recurrence of favourable hybrid-borne recombinations of allelic pairs to be other than extremely rare.

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We may finally conclude, therefore, that hybridisation retards the evolutionary process, on all accounts. Any quantitative assessment of the retardation caused is bound to be rough and more or less hazardous. However, the values involved are large enough to allow the following comparison to be made at our present stage of relevant knowledge.

We have learnt to observe as first priority the avoidance of exposure to irradiation induced mutations and especially to nuclear radioactivity. It is clear that hybridisation (even when the hybrid heterozygous production of unit characters involving unfavourable recessives is reckoned alone, while the prevalence of deleterious hybrid-borne recombinations of allelic pairs is ignored), if fostered and continued unchecked at the present rate for 30 years, may present a much more adverse evolutionary effect than irradiation induced mutations may have in any possible singular nuclear mass exposure of a population. While the avoidance of such an exposure is observed as first priority, it is of an even higher priority to check and reverse induced mass hybridisation.

Now, a sub-race hybrid may be born to marriage partners each of whom may be a member of a low, higher, or the highest sub-race variation group within his or her own sub-race. The hybrid, although failing to qualify for membership of either parent sub-race, is likely to show the distinguishing unit characters and thus to posses the primary developmental qualifications for membership of such a parent sub-race variation group in which he may be accepted and may excel with his operative reactive self-recharge tendency—his hybrid vigour. Hybrids thus qualify for and frequently occupy leading positions and achieve high social status in the population into which they happen to be born, whether the majority stock of the population is made up of people of their paternal or their maternal sub-race.

In either ideological and political camp capital is made not only of the hybrids but also of hybridisation. Some theoreticians find that hybridisation is the only effective weapon for the ultimate establishment of a particular social system.

Effective? Within limits perhaps hybridisation of our "lesser brethren" can be effectively, however clandestinely, forced by inducing voluntary, sexually differential, relatively pure race population movements and resettlements. However, the leading, planning and policy making heads may fail when they attempt to force themselves and their families to breed out if sub-race members, or not to breed back if sub-race hybrids, or to breed down if members of either a higher sub-race variation group or a higher sub-race hybrid variation group.

Ultimately effective? Perhaps the theoreticians concerned may be able to benefit by paying some attention to the developmental grouping as analysed and explained here. They may consider the

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significance of the difference between developmental groups on the one hand and common faith and common interest ones on the other. They may not find it difficult to see that even in a hybrid community the higher sub-race hybrid variation groups are tending ultimately to become more racial as they develop and transmit a great and increasing number of their distinguishing highly favourable unit characters homozygously. Not only the higher intra-sub-racial variation groups but also the higher inter-sub-racial hybrid variation groups in a hybrid community are truly developmental, their ultimate distinction fulfilling all three requirements of a racial distinction as described earlier. Hybridisation will ultimately produce these sub-race hybrid variation groups, while it is certain not to prevent the operation of the inherent tendency of the hybrid to breed back into one or other parent sub-race. The tendencies of selective mating and back-breeding will ultimately allow (*a*) for any particularly favourable mental and morphological characteristics of one or other parent sub-race to become most prevalent in those among the hybridised community who qualify for membership of the higher and highest sub-race hybrid variation groups, and (*b*) for the relative purity of either parent sub-race, whose average ability to survive is comparatively high and into which the majority of the hybrids may tend to breed back, to be largely restored after each wave of induced hybridisation. The theoreticians concerned may have to find another way to break down the interference with social life of developmental, common faith and common interest grouping. It is difficult to see how they could ever manage to arrest developmental progress and grouping by induced hybridisation; although a large measure of retardation is bound to result from any such effort.

THE TENDENCY OF DEVELOPMENTAL GROUP ALLEGIANCE

Satisfied that there is no logical explanation of a particular pattern of characteristic habitual behaviour of sub-race hybrids and non-hybrids, we come to appreciate the effect a particular kind of force has in determining behavioural patterns. It is the force of the operative presence of which we all are fully aware, although we may not understand how it comes to prevail.

This force is understood in what is generally called loyalty or allegiance. It is the adherence to a group sufficiently felt to influence behaviour. As a felt adherence to a group, allegiance is observed to determine behaviour. This is the strict sense in which the term "allegiance" is used here.

Developmental group allegiance is obviously a mental tendency developing in the way similar tendencies appear to evolve. An operative, behaviour-determining, degree of this tendency is always discernible in the non-hybrid, while it first appears to become

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unmistakably manifest when group allegiance is sufficiently challenged or fostered. This observation can be taken to suggest that the tendency of developmental group allegiance may be induced solely by environmental influences. However, the fact that the hybrid does not show a comparable tendency may be taken to indicate that the development of this kind of tendency is determined by a gene interaction between the number of pairs of alleles controlling the development of the unit characters common to the members of the group. Although some more convincing evidence may be needed, it is difficult to deny a hereditary factor in the development of this kind of tendency.

Now, any member of a racial group has the tendency of developmental group allegiance to the race or sub-race concerned as such. If he qualifies for membership of a higher intra-racial or intra-sub-racial variation group he has one more such tendency. This is the tendency of equally developmental group allegiance to the intra-racial or intra-sub-racial variation group to which he belongs by virtue of the living ability value inherent in his more or less favourable (predominantly mental) unit characters that qualify him for the membership of such a group. Only the challenged allegiance influences behaviour, while the other one remains unchallenged. The behaviour-determining force of both allegiances may come to bear in the event of both being challenged at the same time.

The hybrids have no tendency of developmental group allegiance, however, unless they qualify for a higher inter-racial or inter-sub-racial hybrid variation group, in which case they have the tendency of a primarily developmental group allegiance. When the hybrid is born into a non-hybrid community his tendency of developmental group allegiance is to the higher parent race or sub-race variation group in which he may be accepted; when he is born into a hybrid community his tendency of developmental group allegiance is to the higher inter-racial or inter-sub-racial hybrid variation group to which he belongs. In both cases the hybrid belongs to either higher variation group by virtue of the living ability value inherent in the more or less favourable (predominantly mental) unit characters that qualify him as a member of such a group.

A hybrid community usually develops a common faith and common fate group allegiance which may, in critical times, be less or more than a substitute for the race or sub-race group allegiance as a behaviour-determining force.

It is apparent, however, that hybrids become aware of their divorce from one or other parental race or sub-race group allegiance as a fateful deprivation. Many appear to overcome the psychological effect of this awareness; while a considerable proportion appear to respond with the development of a tendency to feel

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resentment and hostility to one or other parent race or sub-race group. It may be that this response is due not only to the hybrid's awareness of divorce from either parent race or sub-race but also to his discriminating treatment by the latter. There are cases in which this response can, on such evidence as can be obtained, be the only motive for hybrids to engage with remarkable constancy in activities detrimental to a parent race or sub-race group.

Hybrids appear to respond thus adversely less and less as their back-breeding progresses. Perhaps the third, fourth or fifth generation back-bred hybrid may be considered already to be around that cape.

HUMANE SOCIAL TENDENCIES

The grouping of men and the formidable environmental interferences human group agency presents in social life are determined largely developmentally but also by common faith and common interest as explained earlier.

It appears strange that in the face of this testing developmental grouping something like a humane social tendency—or tendencies—should also evolve.

This basic humane social tendency can be best understood and described thus: while not aware of suffering or being likely to suffer himself any comparable loss in living ability, a man tends (*a*) to respond helpfully (and/or reflectively to feel an unpleasant sensation) on becoming aware of any other one or more men suffering a loss in actual living ability, and (*b*) to avoid causing another one or more men to suffer such loss. Any adult, however primitive, can be expected to be capable of becoming aware of—of recognising—another man's suffering a loss in actual living ability. Certain breeds of dogs are also known to be capable of this.

Now, the pattern of one's social behaviour is, of course, determined largely by hereditary factors but also to a considerable extent by conditioning educational influence and experience, while group allegiances play their part as well. The question here is whether a man who is not conditioned would show any clearly discernible operative degree of this basic humane social tendency. However, an entirely non-conditioned adult on whom to experiment is difficult, if at all possible, to produce.

Nevertheless, the "do as you would be done by," and the distinction between right and wrong, or that between good and bad, are moral concepts and rules which are significantly known to be invariably made and appreciated by all primitive communities ever studied: terms employed in their languages involve concepts corresponding to right and wrong or good and bad. Any primitive man who is capable of being conditioned, and therefore

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every man, can derive such moral concepts from this, his basic humane social tendency.

If it is correct to assume that, for a primitive man, deriving these moral concepts and rules which he tends to observe from experience and long-term expediency of action is much more difficult (involving tne application of more complicated logical rules) than is deriving the same concepts from his basic social tendency, then the fact that these moral distinctions and rules are made and appreciated in all primitive communities is evidence that the humane social tendency concerned is a heritable mental property.

There are results of studies of twins to indicate a hereditary determinant of criminal conduct. A low, barely operative, degree of this basic social tendency can be understood to be the heritable factor determining the similarity in such conduct between the identical twins observed.

An operative degree of such a basic social tendency is, of course, a favourable unit character in a developmental sense, that is, in the sense that it builds up ability to survive. There appears to be a positive correlation between such favourable characters as an operative degree of the basic social tendency, on the one hand, and high physical and mental capacity, on the other. As explained earlier, the positive correlation between an operative degree of vigour (the reactive self-recharge tendency) and highly favourable physical and mental characters is too obvious to be disputed, and the evidence in support of such a correlation is overwhelmingly convincing. However, an equally positive correlation between an operative degree of the basic social tendency and highly favourable physical and mental properties, although apparent, defies the effort to obtain convincing evidence in its support.

On this scanty evidence, it appears that the basic humane social tendency constitutes a heritable character controlled by a unit gene interaction.

THE TENDENCY OF UNACCOUNTABLE SELF-CONFIDENCE

This is a tendency an operative degree of which, although well known to be positively correlated with particular favourable physical and mental characters accounting for stamina, often appears to be transmitted from one generation to the next as an independent unit character controlled by a particular pair of alleles and not in association with the highly favourable unit characters comprising stamina; that is, not by a unit gene interaction between the various pairs of alleles controlling other favourable physical and mental characters. This is the most important indication of the findings given below.

Investigations into the transmission pattern of, and into the

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significance for survival borne by the difference between, a specific pair of contrasted characters were carried out by the writer, on a small number of patients each time, in hospital and private practice. The characters were an operative high and a strikingly low degree of self-confidence, as evident in the pattern of the reaction of the patient to the usual range of environmental interferences involved in comparable illness and treatment.

The significance for survival of an operative high degree of the tendency of unaccountable self-confidence was found to be considerable in each case.

The self-confidence of the patient was understood to be unaccountable when it involved reliance on his own chances for survival or improvement unjustified on account of medical assessment.

The degree of the tendency of unaccountable self-confidence varied between racially different patients and their related cross-breds so as to suggest that the tendency is transmitted as a dominant character.

It was found that both expectation of favourable outcome as well as faith, however induced, were capable of enhancing the tendency of unaccountable self-confidence equally effectively in the types of patient observed.

The value in ability to survive which an operative degree of the tendency of unaccountable self-confidence may confer in the face of a range of environmental interferences other than those under which these observations were made is, of course, doubtful; unless the tendency is transmitted either together with physical and mental characters accounting for stamina or together with a high, well operative, degree of the tendency of developmental group allegiance.

BIOGRAPHICAL NOTE

G. PANTEL, who is a Berlin M.D., studied physics and physical chemistry from 1934 to 1937 and worked in the Physical University College Institute under Professor Lenz for a year before he studied medicine. In 1944 and 1945 he worked with Professor Werner Schultz at the Rudolf Virchow University College Hospital in Berlin, and lectured on applied physiology.

He then practised in Hamburg and served as a Medical Officer with the British Military Government and later with a Polish Resettlement Corps Unit until January 1948 when he resumed private practice and lectured on general and applied physiology.

In July 1950 he came to London and, among other work, including biophysical and biochemical research, has held a number of senior posts in London and provincial hospitals.

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POISONED DARTS

By JULIANA KADLECSOVICS

PHOTOGRAPHS BY OTTO KADLECSOVICS

I stood on the top of a mountain and looked down on to the plains of Malaya, and to the sea beyond. I looked at the mountain ranges running from north to south, mountains covered in jungle, stretching for hundreds of miles. What lives in there, I wondered, and from my wondering came the journey to find the answer.

Malaya is a prosperous and progressive country, rich in her natural resources of tin-ore, tea and rubber. She has an extensive network of bitumen roads, and a hard-working population of Malays, Chinese and Indians. It is a country of two parts—the well known Malaya and the jungle. It was to the jungle we went. We walked in single file from the brilliant tropical sunshine through a wall of greenery into a strange place of twilight, decaying foliage, exuberant growth and the high-pitched whine of a million cicadas.

There are three racial types of aborigines living in the Malayan jungle, the most primitive of which are the Negritoes: a pygmy race with fuzzy hair, crisp beards, prognathous jaws, heads too big for their bodies, and no fixed abode. They roam the forests with their traps and bows and arrows hunting for game, and have no contact with the outside world. The crossbow used to be their traditional weapon, but most have given it up in favour of the blow-pipe.

The second group are those known as the Malayan aborigines. They are a stocky people with fairer skins and straight hair. They live on the fringe of the jungle and cultivate or work for wages. Many are intermarried with the Malays and it is difficult to tell them apart.

The third group are the Senoi, who are light brown in colour, slender, and have curly hair. They live in longhouses deep in the jungle and practice shifting cultivation. It was to a Senoi village that we were bound, and I wondered if we should find them living in their own traditions or if the twentieth century had already caught up with them.

All the aborigines are generally called Sakai, but as this word has no particular meaning and is considered derogatory by the aborigines themselves it is best not used.

Up steep and slippery mountains we struggled, tripping over creepers, scratched by thorns. Over roaring rivers we went, balancing ourselves on slender tree trunks in the world's oldest jungle. Slipping, falling, soaked in sweat, bloody from leech bites

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and with clammy hair, we pressed forwards, shut in on every side by a tangled wall of creepers. Suddenly the monotony of the shrilling cicadas was broken by the sound of human voices, and the undergrowth was parted by a group of hunters. They wore nothing but loin cloths and crowns of woven rattan around their heads. Each was armed with a blow-pipe and a quiver of poisoned darts hanging from his waist. They were Senoi hunters, on their way to the river to lay fish traps.

We arrived in a village to find that it consisted of one solitary longhouse standing in a sunlit clearing. The longhouse was about thirty feet in length, and stood precariously high on poles. The whole structure was made from bamboo. We climbed a wobbly ladder and entering the hut found a solitary woman squatting on the floor busily weaving rattan into a mat of intricate design. On her lap a three year old child sat, suckling from her breasts. Ignoring us completely she went on with her weaving, so we sat around the fireplace in the middle of the room and took stock of our surroundings. The fireplace was made of a pile of leaves on the bamboo floor, with earth on top. On this were the smouldering logs. In the far corner another woman was busy baking taro roots in hot ashes. She was adorned with a porcupine quill through the septum of her nose. Numerous strings of coloured beads intertwined with her pendulous breasts, and a mass of wild fuzzy hair stood out like a lion's mane.

There was nothing in the longhouse except a few rattan mats, some blackened pots, and bamboo containers to fetch water in. The ceiling was hung with blow-pipes, each made from a straight tube of bamboo some eight feet long and fitted with a cornet-like mouthpiece, reinforced and bound around the base with rattan, and elaborately decorated with designs burnt into the bamboo. As the pipe is very thin and delicate it is kept inside another tube. The blow-pipe is the aborigines' constant companion, and I have never seen a man without one. It is lethal and is used for hunting. A thin dart made from the mid rib of a palm leaf, about eight to eleven inches long and sharpened to needle-like sharpness, is inserted into the mouthpiece, followed by a wad of raw cotton. This is blown out with a sudden expulsion of the breath, and can kill anything up to three hundred feet distant. The dart itself would not inflict a lethal wound but for the fact that it is poisoned with latex from the Ipoh tree, or a preparation made from creepers.

These people live a precarious existence on their hunting and their meagre crops. They eat everything that lives in the jungle: lizards, birds, rats and monkeys, to mention just a few. Their shifting cultivation is a continuous battle against nature. First, all the jungle trees must be cut down and the thick undergrowth cleared away, left to dry and then fired. The ground is then cleared

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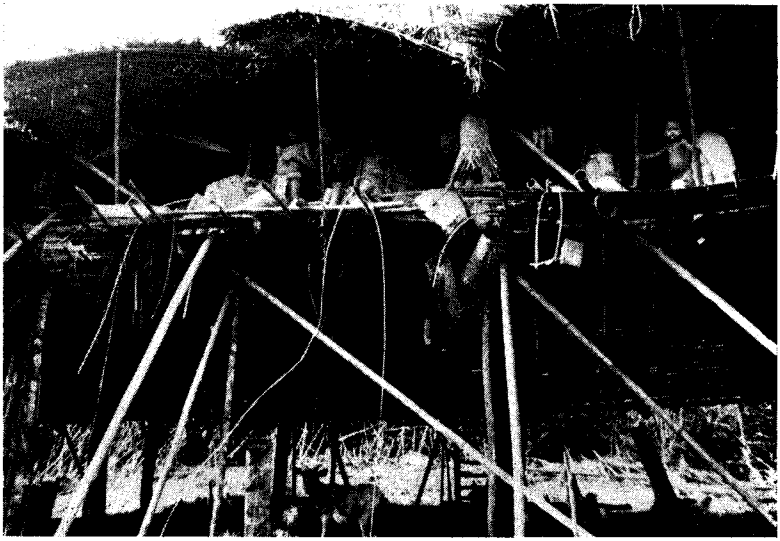
A Senoi longhouse in a jungle clearing. It is made entirely of bamboo.



This precarious habitation is the home of some thirty people and comprises one village

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Bedtime in the longhouse

The Senoi are never idle. Here an old man is making a fish trap.

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Young girls spend many hours weaving dyed rattan into colourful and artistic mats which are used for barter or for sleeping on. Husband and wife share the same "bed" and aspire after as many mats as possible.

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A Senoi beauty

A Senoi hunter with his blow-pipe

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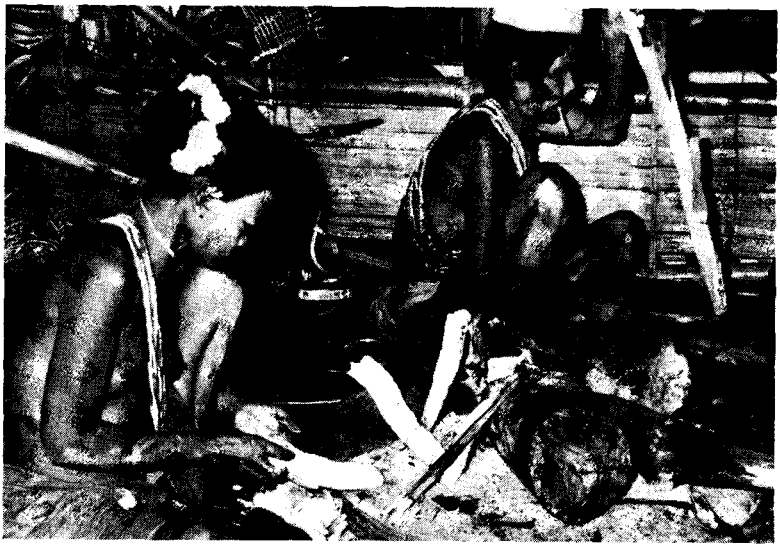

Taro roots, peeled and roasted over an open fire, are eaten twice daily

In this hut the people's sole diet consisted of taro roots. The fireplace is built of banana leaves with earth placed on top.

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of roots and debris, and the seeds are planted in groups in holes made with a blunted stick. As each different species grows, it is harvested. Usually they get crops of rice, maize and taro twice a year, but it is unending work to keep the ground free from the ever encroaching jungle, and protected from birds and monkeys,

Smouldering logs keep insects away whilst father and son discuss the day's hunting

as well as torrential downpours. At the time that we were there, in May, the villagers had nothing to eat except taro roots and what they hunted.

Our visit seemed to bring good fortune, for the men returned from their fishing expedition laden with fish and full of joy. As soon as they arrived, everybody busied themselves blowing up the fires and preparing to eat. Fish were pronged and smoked in the flames, baked in hot ashes or boiled. From three in the afternoon until eight at night, all that could be heard was the munching jaws of men and women as they crunched fish between their teeth, the cries of hungry children forgotten in the rush, and the yelping of a dog getting cuffed for attempted theft. As the art of drying fish is not known, the day's catch is eaten at one sitting. When the last bone had been licked clean and the last tail swallowed, a great peace descended on the hut, broken only and as always by the high-pitched shrilling of insect life in the never silent undergrowth. Tired and satisfied men lay down on the floor on a pile of rattan

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mats beside their naked-breasted wives. Unclothed children cuddled against their mothers for warmth, the door of the hut was shut and the whole village of thirty men and women slept together in the one solitary longhouse.

It was not in all villages that the people had such a quantity of fish to eat, for in the next in which we stayed—also a single longhouse—there were many signs of poverty. When the men returned from their day's labours of felling trees, all that they had to eat were taro roots baked in hot ashes. In spite of what appeared as terrible poverty many of the men wore good watches, and I was told that they had served in the army during the emergency but, being irked by restrictions, had left to return to their own life of freedom.

The old men and women sat for many hours a day, slicing cane into thin strips to make binding, sharpening darts and weaving fish traps. The young girls busied themselves weaving mats for their dowries. Once a year the more adventurous men of the tribe take their work to the nearest bazaar and, for the few Malayan dollars they earn, buy sarongs for the women, salt, oil, tobacco and coloured beads.

After a death in a longhouse it is burnt down and the clearing deserted. Another clearing is made and a new house built.

Roughly speaking the Senoi are animistic and monogamous. A few of the tribes are artistic and carve figures in wood, though most of them have now forgotten this art.

How is it that in a country like Malaya—now Malaysia—the aborigines still live their own life unmolested? It is a question that I could not answer until I had been there, and then I knew why. Try walking in tropical heat in the world's oldest jungle, where everything is against you, and then you will understand why it is that not thirty miles distant from Malaya's smartest hill restort —the Cameron Highlands—where British, Chinese, Malays and Indians play golf and drink whiskies in the lap of luxury, the aborigines live as they have always lived and want to live, behind a thick green wall of jungle.

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EUROPE AND THE HUNS

By C. D. BLAKESLEE

Innumerable volumes have been written pertaining to the effect of nomadic peoples upon agrarian civilizations. As far as I know, however, meagre effort has been devoted to the opposite problem. Indeed, what is it that commonly develops among the nomads by virtue of their conquests of settled peoples and even highly developed cities? The entire matter is ordinarily resolved by merely saying that the nomads become civilized. Yet this is no solution. Why do the nomads become civilized and how do they become converted from nomadic to settled peoples?

A cursory glance at the anthropological literature or the mounds of historical work would quickly reveal that in some instances settled agrarian societies become wandering nomads. The Navaho Indians of Arizona readily gave up nomadism and turned to an agrarian way of life, whereas the Pawnee of the Great Plains gave up farming and took to the horse.

Nomads such as the Bedouins of Arabia rapidly conquered an enormous empire, but so did the settled Roman farmers. It seems to me quite erroneous to look at the nomad as the attacker and the farmer as the defender. Both nomads and farmers may be attackers or defenders. Obviously, the construction of empires and the rise to civilization, or "even the fall from civilization," cannot be analyzed merely by making a simple-minded distinction between nomadic peoples and settled populations.

Of course there are things that nomadic peoples can do that settled societies would find impossible to accomplish. The reverse aspect of this proposition is likewise painfully obvious. It seems quite reasonable to me that sociologists might study the momentous struggles between nomads and farmers with the hope that greater understanding of social change might develop. Historical records present a limitless opportunity to analyze a social change in terms of these momentous struggles.

One good reason for studying the struggles between settled societies and nomadic tribes concerns a simple proposition. Since the two ways of life necessitate totally different social organization, and since this difference is sharpened through conflict, the dynamics of social change might prove to be more clearly discernible in such contexts. At least that is the contention behind the writing of this paper. Moreover, I propose that fundamental changes in the economic institution necessitate modifications throughout the social order. Two issues constitute the dominant

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theme throughout this paper. What effects did the Hunnic invasion have upon the composition of the Roman Empire, and what effects did the Roman Empire have upon the social organization of the Huns? Obviously the effects upon the Huns were particularly drastic, since they disappeared as a social entity.

In A.D. 376 Hunnic nomads erupted out of Central Asia. These Asian nomads crushed the Gothic states which had been established on the European Steppes between the Don and the Roman frontier (the Danube). The Goths were flung in every direction, but mostly they were flung at the Danubian border of the Eastern Roman Empire. The government at Constantinople decided to capitalize on the plight of the Gothic peoples. Consequently, the Goths were invited across the Danube to settle several regions of the Balkans which had been previously depopulated. The local governors ruthlessly exploited the Gothic settlers, and this resulted in widespread plundering and pillaging by the barbarians in retaliation for the Roman abuse.

In 378 the Emperor Valens decided to chastize the Goths. He tragically neglected to obtain reinforcements from the more distant army garrisons. His rash act was rewarded by the destruction of his army and his own death. Thus for two decades the Goths had open access to Roman booty.

Before the Huns had penetrated Eastern Rome in the first decade of the fifth century, the chain of military events within the Empire had taken the Goths and other tribes as far west as Spain. The major influence of the Huns upon Western history was not their attack against either division of the Empire but the uprooting of the Germanic hordes along the entire northern border of Rome. It appears that the political and economic eruptions of this period were triggered by the Huns crossing the Don in 376, driving the Goths westward before them. This resulted in the destruction of the West Roman State and the severe impairment of Eastern Rome.

Before discussing the Hunnic deprivations of Europe, it would be desirable to sketch the situation in south-eastern Europe before the Hunnic invasions. At the beginning of the Christian era the Sarmatians—a large aggregation of Central Asian nomads, culturally related to the Scythians and Alans—were pushing slowly westward from Central Asia along the great Steppes. The Sarmatians gradually absorbed and surplanted the Scythians while slowly advancing from Central Asia along the grassy Steppes into Europe.[1] Not only were the Sarmatians and Scythians closely related culturally, they were also quite like their Central Asian successors, the Huns. The flow of tribes from Central Asia was

[1] Williams M. McGovern, *The Early Empires of Central Asia*, Chapel Hill, North Carolina, 1939, pp. 35-59.

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interrupted and to a degree counteracted by the intrusion of Gothic peoples into the region of the Steppes.[2]

During the last half of the second century the Goths were pushing from Germany south-eastward along the Roman border. During the first half of the third century they gradually overwhelmed the Sarmatians. By 240 the Gothic kingdoms had grown powerful enough to control the Sarmatians and make a mass attack upon the Roman provinces along the lower Danube. They had, however, picked a bad moment to grapple with Rome. The armies of Eastern Rome were particularly strong and effective at that point in history, and the Gothic hordes were decimated, leaving the Danubian border in peace for more than one hundred years. Thus, the Gothic kings then decided that it would be more prudent to consolidate their holdings beyond the borders of Rome. Up to 376 the Ostrogoths were gradually establishing a loose empire between the Don and the Danube, and during this time the Visigoths and other Germanic tribes were incorporated into the empire of the Ostrogoths. Had the Ostrogoths been permitted to continue the development of their empire, the future of Europe would have followed a profoundly different course.[3]

During the time that the Steppes between the Danube and the Don were being conquered by the Germanic peoples, the Alans were conquering the grasslands east of the Don—thus ending Sarmatian control of south-east Europe. However, neither the Goths nor the Alans were able to enjoy the fruits of their conquests for more than a generation or two.

Even though the Alans had been known to history since the time of Herodotus, they had never posed a major threat in the region of the Steppes in spite of being quite numerous.[4] Throughout the several centuries of their contact with the classical world their power and influence had fluctuated considerably. Moreover, neither the Alans nor the Ostrogoths had sufficient political unity and military strength to withstand the shock of the Hunnic invasions.

Even though the Huns appeared rather suddenly in Europe, the Chinese had known them for many centuries.[5] Beginning in approximately 500 B.C. the Huns conquered parts of China from time to time. The last and most complete Hunnic domination of China occurred from about 50 B.C. to about 150 A.D.[6] Although the Huns were in control of nearly all of China, a series of revolts drove the conquerors out of the Far East into the Steppes of

[2] *Ibid.*, pp. 356-372.
[3] *Ibid.*, pp. 350-360.
[4] *Ibid.*, p. 30.
[5] *Ibid.*, pp. 87-108.
[6] *Ibid.*, pp. 278 and 308.

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Central Asia. After the series of revolts in China, the Chinese, in conjunction with the Mongols, gathered enough strength to drive the Huns back into Central Asia where they remained in obscurity for 200 years. These fierce nomadic horsemen suddenly left the obscurity of Central Asia when they made their devastating attack on south-east Europe, crossing the Don in 376 A.D. The Huns so terrorized the kingdoms of the Steppes that agricultural and nomadic nations alike were caught up in a whirlwind of confusion.[7] In spite of the fact that neither Eastern nor Western Rome was able to stop the westward torrent of uprooted peoples, the flood was partially stemmed by the Eastern Empire and absorbed by the Western Empire.

As I have noted before, the government of Valens offered to give protection to the Visigoths inside the Roman border. It appears that the local governors of the Balkan provinces intended to settle the Goths upon depopulated land and then exploit them. Because of this, Gothic families were forced to prostitute young girls and boys to obtain food.[8] Many Goths sold themselves or members of their families into slavery for the necessities of life. The Visigoths rebelled in 378 destroying a large Roman army and killing the Emperor Valens.[9] After this battle the eastern provinces were left poorly protected against the inroads of Ostrogoths, Vandals, Alans, and other tribes. By the year 400 the Emperor Theodosius had been able to restore order in the Balkans. The king of the Visigoths, Rodegius, found the Balkans too restrictive. so he began leading his tribesmen towards Italy.[10]

In 405 the Visigoths were defeated by the Roman army in the Po Valley. In this battle, ironically enough, a major king of the Huns, Alden, with a large command of his cavalry supplied the Roman army with the manpower it needed to defeat the Goths. This was by no means a novel arrangement, since the Romans often hired the services of barbarian soldiers.[11]

It is not clear when Alden became the overlord of the Huns, but the gold and booty which Alden and his men obtained in Italy may have enabled him to command enough respect among his people that he could quickly take control. Whatever the case may be, soon after his troops left Italy, Alden led the bulk of the Hunnic peoples against the Eastern Empire. For the next ten years Alden led his troops first against the Eastern Romans and then against the tribes of Germany, and consequently during this

[7] C. D. Young, *The Roman History of Ammianus Marcellinius,* London, 1887.

[8] *Ibid.,* p. 598.

[9] *Ibid.,* pp. 608 and 613.

[10] *Ibid.,* p. 622.

[11] E. H. Thompson, *Attila and the Huns,* London, 1948, p. 40.

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decade trouble raged along the entire border of the two empires. As a result, such tribes as the Saxons, Franks, Burgundians and others crossed into Gaul. While this was going on the Vandals and the Alans moved into Gaul and thence into Spain.

During the years 409 and 410 the Goths attacked the city of Rome three times. The third time the Goths captured the city and removed all the booty they could carry, after which they moved on to Gaul and settled there.

Thus, the Western half of the Empire was filled with the tribes which had been drawn by new land and booty, as well as pushed by the revived vigor of the Eastern Romans.[12]

Between the years 415 and 430 the Huns were absent from internal Imperial affairs. Possibly Alden died about 415, and if so it may have been that the Huns were having internal power troubles which may have prevented them from making further raids within the Empire for those fifteen years.[13] It may have been, however, that they were busy consolidating their power among the barbarians of the forests and Steppes of Europe. But in 430, under the control of Rua, they crossed the Danube again. After much pillaging, the Huns were bought off by the government in Byzantium. Rua died after this venture and the most famous of the Hun kings, Attila, assumed control. Until 445 he shared his power with his brother, Bleda, who either died naturally or was killed by Attila.[14]

In 435, 441 and 447 Attila led attacks against the Eastern Roman Empire, resulting in widespread plunder of the Balkans. After each campaign Theodosius II (the Milksop Emperor) purchased peace with monumental bribes. Needless to say, the booty gained from the raids coupled with the payments from Byzantium yielded much wealth for the Huns. Throughout this time Attila sent a constant stream of envoys to Rome to protest or threaten. Since the government of Byzantium presented splendid gifts to envoys as a demonstration of the wealth and power of Eastern Rome, the followers acquired large personal fortunes.

Between attacks on the Balkans, Attila led his troops against the tribes of Germany, the Slavs of the forests, and bands of the Huns which still had their freedom.

In 451 Attila led the Huns on a campaign into Gaul. Here, however, the Romans, with their barbarian allies, defeated the Huns in one of the bloodiest of battles.[15]

Although Attila had been defeated he planned a new campaign against the city of Rome. While his army was still in northern

[12] *Ibid.*, pp. 95-124.
[13] *Ibid.*, pp. 43-62.
[14] *Ibid.*, pp. 63-94.
[15] *Ibid.*, pp. 125-160.

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Italy plague and famine raged throughout his troops. The defence of Italy and Rome was in the hands of the Roman general Attius. Since the Romans could not convince the Germanic barbarians to leave Gaul for a campaign against the Huns, the legions of Italy faced the invaders alone. Attius could do little more than fight a delaying action. The city of Rome was saved by the action of the Pope, Leo I, who induced the Huns to leave Italy by granting them a splendid gift of gold and other treasures.[16] The next year, 453, Attila died in his sleep after one of his drunken orgies.[17] The struggle which ensued among his many sons for control of the Huns destroyed their power amid chaos.

During the fifty years after the death of Attila the fortunes of the Huns went from chaotic to disastrous. The terror of the Huns had gone, and so had the ferocity of the horsemen. The Hunnic tribes were rapidly displaced or absorbed by the jostling Germans. In a few decades the Huns disappeared from history for the last time.

Why was it that the Huns had such a meteoric rise and such a sudden eclipse? Although there are enough documents to make a few guesses about the answer of this question, there are not enough data to be certain about the matter.

At the time the Huns crossed the Don in 376 they had a simple nomadic herding culture. Whatever civilization they received as conquerors of China must have vanished during the 200 years of life on the Steppes before their appearance in Europe.[18]

Nonetheless, the horse culture of these Asian nomads* proved to be a military horror to the settled power of Rome. What the Huns did directly or indirectly to the Roman Empire was much the same as those things many nomads have done to numberless high civilizations. Although the two divisions of the Empire were at best shaky, the blows of the Huns hurried the fall and modified the results of what was once Imperial Rome.

The culture of the Huns was rather simple. They were pastoral folk who lived on horseback, existing on their flocks. The surrounding wildlife supplemented their herds for food and clothing. The women and small children lived in tents mounted on two-wheeled carts. They dressed in boots, trousers, capes and caps. Their clothing was made of fur, leather and felt.[19]

Due to the need for grazing room it is obvious that the Huns

* Although they were Asian they were Caucasoids, not Mongoloids—hence the Chinese references to the White Huns. Central Asia was anciently settled by Caucasoids, probably Nordics, many of whom had blue eyes.—EDITOR.

[16] Williams M. McGovern, *op. cit.*, pp. 373-388.

[17] E. H. Thompson, *op. cit.*, pp. 184-203.

[18] Williams M. McGovern, *op. cit.*, pp. 356-372.

[19] C. D. Young, *op. cit.*, pp. 578-579.

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were compelled to live in bands of a few hundred or at most a few thousand. The men of each band belonged to a given *gens*, making the political and kinship system completely intertwined. Such nomads cannot rapidly increase their population without rapidly increasing their territory. Their enforced mobility prevented the accumulation of tools and raw materials necessary to produce surplus goods or even more than the bare essentials for day-to-day living. Their culture equipped them to be an offensive rather than a defensive power. The organization of the band trained the men from childhood to old age as integrated members of the cavalry for either working or fighting. Thus each band had its own well trained troop of horsemen. Moreover the food supply and the families of these troops could travel with or near the small army. Defense against such an army was difficult, and attacks upon such mobile people were nearly impossible.

The obvious weakness of such a system was the inability to obtain unity of action without losing freedom of movement. Another built-in weakness was their inability to produce the surplusses in weapons and foods to carry out massive long term expeditions. Their system did not permit the removal of disadvantages without the loss of these necessary advantages.

In short, the disadvantages of the Huns were both political and economic. Their advantages were primarily military and psychological, for their completely unorthodox customs and fierce fighting terrorized the Gothic farmers.

During the eighty years that the Huns struggled with the Romans they were forced to unite their nomadic bands to snatch booty from the Empire and dominate the surrounding Romanized barbarians. Since the Hunnic tribes were not populous they could unite rather easily for short periods. Their small numbers permitted them to settle in a restricted area, centrally located and reasonably defensible. If they could do this they could have the advantages of unity and stability.

The tribute obtained from the Germanic agriculturalists, and the bribes and reparations paid by the Roman people, gave the Huns the wealth necessary to accomplish the changes mentioned above.

They settled in Hungary, whence their cavalry could dash to any danger area. The gold and jewels taken from the Romans were used to buy food and weapons from the merchants of the Empire. The conquered Germans also yielded food and soldiers for the Hunnic enterprises. The Huns did not need to make surplus goods, they took them. This gave them a surplus economy as long as they had a successful army.

As soon as they obtained a centralized political system and a surplus economy, class stratification rapidly developed. The addition of captive troops to the army and the sudden growth of class

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barriers probably did little to maintain the spirit of the Hunnic forces.

By the time Attila came to power most of the political and economic trends mentioned above had already taken shape. His success as a general and as a ruler was no doubt in part due to his ability to capitalize on the cultural revolution occurring among his tribesmen.

The sudden destruction of the Huns after the death of Attilla was perhaps due to the growth of cultural conflict between old Hunnic traditions and new Roman practices within their basic social institutions. No doubt the many sons of Attila, the conflict between the Roman and Hunnic institutions, and the resiliant Germans, pulled and pushed the Huns in several directions politically, economically and militarily.

Throughout this paper the implication has been that few important cultural traits or social institutions were adapted by the Empire specifically from the Huns. Instead, I have implied that the Huns influenced the West most by militaristic actions. First, the Huns drove hordes of barbarian tribes into the Empire during the last quarter of the fourth century. Second, these Asians drained the Empire economically by accomplishing mass invasions or threatening to do so during the second quarter of the fifth century. It is probable that the first of these two phases of Hunnic power was the most devastating to the Roman Empire generally, but principally to the western provinces specifically.

The first shock of the Hunnic invasions disturbed the pattern of ethnic distribution throughout Europe. The Ostrogoths, Visigoths, Vandals, Alans and other tribes were pushed into the eastern provinces. The internal struggles within the Empire which ensued prompted most of these barbarians to work their way westward, where they were able to accomplish mass settlements in Gaul and Spain.

Shortly after the Huns had uprooted the tribes of Eastern Europe, the nomads directed their efforts against the tribes on the Rhine (from 405 to 415). The result of these far flung and savage attacks was a complete destruction of power relationships among the barbarian tribes, and prolonged devastation and resettlement of the western provinces.

By the third decade of the fifth century the Huns had established rather permanent and concentrated settlements on the plains of Hungary. It is probable that the reactions of the Romans and the numerous Germanic tribes to the Hunnic exploitation had forced the Asians to unite their forces—militarily and politically. Moreover, the riches obtained by the Huns from successful raids enabled them to form concentrated settlements. This settled condition of the Huns with their riches made it profitable as well as possible for the Roman merchants to establish a lively trade with Hunnic consumers.

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Since the Huns were not culturally prepared for agriculture or manufacturing, they needed—as well as wanted—the products of the Roman economy. No doubt the nomads received many new ideas and practices from their Roman commerce, and by this time the Huns had had prolonged contact with the border provinces and Romanized tribes.

Since the Huns first arrived in Europe they had been in close contact with the Germanic tribes. The nomads often induced the border tribes to join them for raiding parties, or forced them to supply troops for major campaigns. From fighting both with and against the Germanic peoples it is probable that the Huns received some Germanic customs. Moreover, the subjugated peoples who were left outside the Empire were forced to give slaves and staple goods to the Asians.

Thus the Huns abandoned their nomadism and small tribal units. They lost their clear cut military and psychological advantages mentioned above. The Hunnic peoples experienced a period of very rapid cultural change.

Sudden and profound cultural change may be termed "cultural shock." The people experiencing such change tend to become confused in their ethics, morals, attitudes, beliefs, and relations between old and young, male and female. These behavioral confusions may result in a social disintegration—of which many cases in point are provided by the American Indians such as the Sioux, Pawnee and Omaha.

Perhaps such confusion did much to weaken the Huns after settling in Hungary. Possibly, much of their success against the Balkan provinces in the attacks of 435, 441 and 447 was due as much to their reputation as to the weakness of the Eastern Empire. Interestingly enough, after about twenty years had elapsed from the time of Attila's rise to power, the horsemen of the Steppes were crushed in Gaul in 451. The next year their campaign against Italy was little more than impotent. The Hunnic power and even their very existence was quickly challenged; at any rate the Hunnic society did not withstand the struggle for leadership that followed Attila's death in 453. They and the tribes they had uprooted perished, even though they left a monumentally changed ethnic map.

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A TRIBUTE TO REGINALD RUGGLES GATES

By RAYMOND A. DART

Study of Professor A. Dendy's *Sphenodon* material at King's College, London, led to my earliest acquaintance with the late Reginald Ruggles Gates in 1919. He was Reader in Botany there and I was a privileged visitor from Grafton Elliot Smith's Anatomy Department at University College. This tenuous contact was soon severed by my travelling to America for a year (1920-1921), as one of the first two foreign fellows of the Rockefeller Foundation, and disrupted within a year of my return to London by my departure for Johannesburg towards the end of 1922.

Seven years later Gates came to South Africa with the British Association for the Advancement of Science, but this botanist gave us little indication of his awakening interest in anthropology. That year, 1929, however, marked the publication of his *Heredity in Man* and his papers on blood groups of Canadian Indians and Eskimos and Amerindian crosses in Canada. But these and his other studies of mental defect, brachyphalangy, racial blood groups, eye colour and physiognomic inheritance were unknown to me until the publication of his classical two-volume work *Human Genetics* in 1946, shortly after the Second World War.

Temporally this work synchronised with the late Dr Robert Broom's and Dr G. W. H. Scheper's monograph *The South African Ape-Men: The Australopithecinae*. The first pelvic fragment from Sterkfontein and the first occipital fragment from Makapansgat were found the following year, 1947, whose opening had witnessed the holding of the First Pan-African Congress on Prehistory. Not a single American anthropologist of note had attended it. The status of the australopithecines was in virtually the same condition of suspense as it had been since 1925, although Le Gros Clark from England and Camille Arambourg from France had affirmed their belief at that congress.

Sir Arthur Keith had withdrawn his opposition in 1946 and made what he had then contritely termed the Dartians the prophetic keystone of *A New Theory of Human Evolution* in 1948. But few, if any, anthropologists outside South Africa were prepared for the impact of the two florally decorated, intellectual bombs presented to them by R. Ruggles Gates in *Human Ancestry: From a Genetical Point of View* in that selfsame year.

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These two herbaceous diagrams, doubtless intended by him merely to animate the lifeless branches of earlier anthropological family trees, received the most chilly of receptions from his fellows in our race-embittered, war-ridden world. Although Gates himself warned that they "need not be taken too seriously," and the late Professor Earnest Hooton drew specific attention in his foreword to the unprofitable nature of all taxonomic discussion (because of its lack of genus and species definition and consequent arbitrary nomenclature), the emotional reaction his conception of parallel evolution evoked alienated attention from the major merits of his astounding performances in this as well as his earlier works.

Dr J. A. Fraser Roberts' excellent obituaries of Gates[1] have drawn much-needed, sympathetic attention to the frequency with which the thinking of "Gates was ahead of his time, as has happened so often in science. . . . His were discoveries made before their significance could be recognised." He was the first to find a tetraploid form of *Oenothera* and to clear up the problem of polyploidy, and the first to discover non-disjunction of the chromosomes. His first book, *The Mutation Factor in Evolution*, was written over half a century ago, in 1915, but it had conceptualised the gene as "a stereochemic re-arrangement in the complex molecule of the nucleic acid." He too had been one of the first to realise the value of the blood group studies for genetical anthropology and to pioneer their application amongst Indians and Eskimos in his Canadian homeland.

For South African and East African anthropology, indeed for all anthropologists who read the book, *Human Ancestry* was a staggering first; not only because it had come from the brain of a botanist, true to his Linnean taxonomical background, but also because it is a hitherto unexampled holistic distillation by an outside observer of the whole field, geological, anthropological, archaeological, racial and pictorial, and from a hitherto unexploited angle—a feat in a little over 400 pages possible then only for a brain such as his with its phenomenal, photographic memory, mastery of many languages, conscientiousness, thoroughness and industry.

Certainly as far as the entirety of the work done between the two world wars in the southern half of the African continent is concerned the anthropological world would have remained ignorant of a considerable proportion thereof without access to his masterly survey at that critical stage when its pristine australopithecine and archaeological wealth first began to attract world-wide attention. His recognition of Frassetto's contribution to the understanding of variation in cranial form still remains unappreciated; but, as in

[1] *Man*, Vol. LXXII, 1962, article 289; and *Biographical Memoirs of Fellows of The Royal Society*, Vol. X, 1964, pp. 83-106.

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other matters, this too may have been part of the premature thought of this pathfinder.

The phenomenal recent advances in the number of scientists, the financial support their labours enjoy in all developed countries and the avalanching accumulation of information resultant therefrom obscure current appreciation of the backroom function discharged by Gates and many other scientists of that between-war period in encouraging and assisting intellectually competent but financially embarrassed generations of students to devote their future to research. It was the era of personal and institutional support, not of public and governmental stimulation of scientific research.

Libby's discovery of C-14 dating in 1947 gave such hope of precisional knowledge replacing guess-work that anthropology soon became recognised automatically as early human history. In 1958 Evernden and Curtis's K/A technique for dating volcanic sediments showed that the earliest stages of man's emergence from apedom would ultimately be time-tabled by means of isotopes. Future students would gradually trace by such means the migrations of populations and the dispersal of the cultures they enjoyed with an accuracy beyond human imagination during the earlier half of the twentieth century. But it is salutary to recall that this geneticist (1882-1962), who had already achieved scientific fame before the First World War, and did not hesitate to serve in the ranks during it, turned the same intelligent devotion to unravelling human racial divergence. He did not imagine for a moment that he had solved these mysteries but he had an irrestible passion to collect the facts and to set the explanations as he saw them upon record fearlessly. For, as he wrote in the modest preface of that book, which will always remain a landmark in the history of African, if not of all, anthropology:

> It is only by learning how man has come to his present state that we may hope intelligently to control in any measure his future development. This book is offered as a small contribution to that end. In the present disturbed state of the world it is important that questions of race and population be recognised as the fundamental problems they are.

My wife and I met him briefly at Harvard in 1949, but it was our joint privilege to see him in our home and know him somewhat more intimately when he returned with his third and most devoted wife to South Africa in 1955. They had initiated here those trans-continental journeys for the study of racial crossing which were to occupy their skilled and happy collaboration for the remainder of his life, which so regrettably and to the great loss of anthropology was fated to terminate only seven brief years later.

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We all met again unexpectedly in Copenhagen in the first week of August 1956 during the First International Congress of Human Genetics, where he presented his records of Y-inherited hairy ears in India. As both our parties resided in the Hotel Egmont during that congress we saw more of one another then than had previously been possible. Little did we expect that it would be our last such opportunity. He was planning even in the year of his demise their return to Africa for further field-work.

It was his observation during that 1955 African trans-continental investigational tour from Cape to Cairo of three cases of hairy ear rims—all Indians—which directed his attention later in the year to the frequency of that trait in India, and led to his collecting about twenty pedigrees of that condition in southern India,[2] as well as to the subsequent corroborative work thereon carried out by his former Ph.D. student, Dr P. N. Bhaduri, Professor of Botany at Presidency College, Calcutta, and reported at the Second International Congress of Human Genetics in Rome in September 1961.

I mention his discovery of this condition of hairy ear rims carried in the Y-chromosome not only because it was another of his firsts, but because it is at present unique, for nothing else is yet known to be carried by the Y-chromosome of man. The first of the GATES MEMORIAL PAPERS[3] is important because it records his elation that Dr C. E. Ford—another of his students who had taken a botany Ph.D. and did research on the genetics of rubber in Ceylon—had also participated with Hammerton (1956) in confirming that 46 (22 pairs of autosomes and the x-y pair) was the human chromosome number, and had then discovered the first known example of non-disjunction in man—as Gates had done half a century earlier in plants—in a failure of the X- and Y-chromosomes to separate in the reduction divisions; and that in the succeeding years medical literature had been filled with many varieties of such instances accompanying abnormalities of the sex organs as well as other physical and metabolic disorders.

These facts reveal how impossible it is for us also to measure the impact of Gates upon modern medical—as well as botanical—knowledge both personally and also indirectly through the scores of those he encouraged and stimulated. So too is it beyond our ability to compute the influence he and his world-ranging observations and works have already exerted upon anthropology irrespective of their inherent potency in directing further

[2] R. RUGGLES GATES MEMORIAL PAPERS 1: THE INHERITANCE OF HUMAN ABNORMALITIES, The Mankind Quarterly, Edinburgh, 1963; and MANKIND MONOGRAPHS 1: THE INHERITANCE OF HAIRY EAR RIMS by R. Ruggles Gates and P. N. Bhaduri, The Mankind Quarterly, Edinburgh, 1961.

[3] *Ibid.*

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anthropological investigations and concepts. Up to the end his mind was full of practical plans covering his projected activities during the next decade and luminous thoughts on what he had already observed.

Amongst these latter are to be reckoned his conception of fractionation of genes[4] and its potential application to both anatomical and physiological divergences, as well as his differentiating between single dominant and recessive genes on the one hand and the multiplicity of correlated genes forming the basis for racial differentiation on the other hand.

Others are more competent to assess the value of these genetical contributions. My concern here has been simply to pay a tardy tribute to the integrity of this contemporary I have been privileged to meet and know; to acknowledge the indebtedness of today's anthropologists in general and of those in Southern Africa in particular to his appreciative writings and personal field-work; and to deplore the loss of an intellect with his capacity for embracing the totality of the human spectacle and for presenting it to his colleagues so concisely and graphically. However intense human emotions become and whatever conflicts arise through racial divergence and cultural diversity the fact remains that knowledge of how they came to be is the only likely means of their ultimate control. That was the belief of Gates and his life purpose.

[4] *Nature*, 1960, Vol. CLXXXVI, pp. 739-740.

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The Prehistoric Ethnology of Palestine

By F. J. LOS

Thanks to the work of several generations of archaeologists, among whom were men of outstanding reputation, the prehistory of Palestine is better known than that of any other country except France. The discoveries made since the beginning of this century by these indefatigable workers are the main reasons why the epoch-making book by the late Professor A. H. Sayce, *The Races of the Old Testament*, first published in the year 1891, which inspired the present writer to study the ancient ethnology and anthropology of this interesting country, is now in some respects antiquated.

Palestine was already inhabited by man at a very early time: the oldest artefacts thus far found in its soil date from the Second Interglacial (Interpluvial) period. From the Third Interglacial (*c.* 150,000-120,000 B.C.) date a dozen skeletons, dug up in the caves of Mount Carmel and in the vicinity of Nazareth, which proved to be of a half-Neanderthaloid, half-homo sapiens character. As this mixed population exercised no discernible influence on that of later times, we can leave it out of consideration. The oldest population of a racially determinable character were the so-called Natufians, the bearers of the Natufian culture (*c.* 8000-6000 B.C.)—named after a site on the Wadi-el-Natuf in northern Palestine where Miss Garrod unearthed its remains.

From their skeletons it can be concluded that the Natufians belonged to an early form of the Mediterranean race. They were all long-headed and had a slender and delicate stature, but the height of the men hardly surpassed 4 ft 11 ins, presumably as a consequence of insufficient nourishment.[1] Although for their subsistence they mostly depended on hunting and fishing, they already practised a primitive agriculture, but the dog was their only domestic animal. As similar skeletons have been found in Egypt, dating from the pre-dynastic period, and also in the chalcolithic cities of Byblos and Gezer, it is to be inferred that the contemporary population of other parts of Palestine and of Syria also belonged to the Mediterranean race.

In the following period, the Neolithic (*c.* 6000-4200 B.C. accord-

[1] According to Paudler (1924), pp. 73 and 74, the phenomenon of very small height occurred also in Europe at the beginning of Neolithic times and was due to the cause indicated in our text.

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ing to Albright), this population was fully settled, depending mostly on agriculture and cattle breeding. At least some of its villages were fortified; and Jericho, which originated at the beginning of this period, is dubbed the oldest town of the world.

Of Neolithic date also are the many *dolmen, menhirs* and *cromlechs,* and some fortifications, which are found throughout Palestine, especially in Transjordania. It is plausible to connect these Megalithic structures with those of North Africa and to assume that they were erected by the same people. As it is generally supposed that the latter are the work of tribes who belonged to the blond,* tall and heavily built race of Cro-Magnon (also named the Atlantic race), it is not too risky to suppose that one of these Hamitic-speaking[2] Libyan tribes had penetrated at an early time into Palestine, where it continued its architectural traditions. If this supposition is correct, this earliest layer of blond immigrants may be sharply distinguished from the later blonds, of Aryan descent.

During the Eneolithic (4200-3200 B.C.) and the Early Bronze Age (3200-2150 B.C.) Palestine prospered and was relatively well populated. Mediggo, Beth-shan, Jericho, Aï and other towns possessed houses which had wooden roofs and were well built of lumps of dried clay and were enclosed by thick walls of stone.

Many of these fortified settlements were, however, destroyed and abandoned at the beginning of the Middle Bronze Age (2150-1550 B.C.) when the population suddenly declined and became mostly nomadic in character. It was the time of the first "swarming off" of the Semites, the so-called Canaanitic invasion, which made itself felt in Mesopotamia by a series of infiltrations. Professor Albright thinks that the cause of their emigration was a change of climate which brought about a progressive desiccation of the steppeland of North Arabia, the homeland and cradle of the Semites, who were identical with the Orientalid (or Eastern Mediterranean) race of anthropology. About this time or a little later must be placed the story of the migration of the patriarch Abraham from northern Mesopotamia[3] to Canaan, a story that contains, according to Albright, a kernel of truth.

The shifting of the climatic zones which accompanied the trans-

* Blond as far as skin colour is concerned, but rather black to red in colour of hair.—EDITOR.

[2] The author agrees with Paudler, who thinks that the Hamitic languages originally belonged to the blond Cro-Magnons. This assumption is in remarkable agreement with a statement by Karst, who supposes that the oldest layer of geographical names in Palestine (for example, the name Jordan) is Hamitic. *Cf.* Karst (1931), p. 63; and Paudler (1924), p. 47.

[3] And not from Ur of the Chaldees, *cf.* "Early Hebrew and Palestinian Ethnology" by R. Gayre of Gayre, THE MANKIND QUARTERLY, Vol. III, No. 4, April-June 1963, pp. 238-253.

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ition of the warm and moist Atlantic into the drier sub-Boreal phase of climate about 2500 B.C. had still more consequences. It also caused the swarming off of the Indo-Iranian or Aryan peoples who roamed at that time as nomads in the steppes of south Russia, whence they penetrated about the year 2200 into the Near East. "A host whose onslaught was like a hurricane, a people who had never known a city,[4]" a frightened scribe of Ur wrote on his clay tablet about that time with reference to the wild Amurru,* the Amorites of the Old Testament. They are identical with the Amar of the Egyptian monuments (of a later date), who are depicted with blue eyes and Nordic features. Their name is somewhat misleading, as in the Akkadian languages Amurru simply means "the West" and is used to denote northern Syria, but—here as in so many other cases—the conquering people were named after the land they had occupied.

About the year 2100 B.C. the Amurru overran Babylonia, there to found a new dynasty which maintained itself till the year 1730 B.C. Hammurabi, the famous lawgiver who belonged to this dynasty, declares in the preface to his codex of laws that he has come "to rise as the sun above the black-haired people and to shine my light over the country"—words which are only understandable on the assumption that he himself was blond.[5] In 1730 the Amoritic dynasty was overthrown by the Kasjsjoe, or Cassites, another Aryan tribe, which had dwelt till that time in the Zagros Mountains. The Cassite dynasty ruled over Babylonia till about 1150 B.C.

Shortly after the year 2000 northern Syria became the starting-point of another group of conquerors who are known in Egyptian history as Hyksos. They occasioned a great southward migration which resulted after a lapse of time in the conquest of Palestine and Egypt. Although many Semitic and Alarodian (or Caucasian) tribes—the latter of Armenoid race and belonging to the Hurrian people, which was autochthonous in north Syria—took part in the movement, it was headed by clans of the Amorites,* who were also designated by the name Mitannu. About 1700 B.C. these Aryans founded the fifteenth Egyptian dynasty, whose princes bore mostly non-Egyptian names. What happened is described by the famous Czech linguish and orientalist, the late Professor B.

[4] Piggott (1952), p. 239.

* The original Amurru were Canaanitish East Mediterraneans, but when the Nordic Aramaeans came to settle in their land they also became known as Amorites.—EDITOR.

[5] *Cf.* the book by the American archaeologist J. B. Pritchard, *Archaeology and the Old Testament*, p. 176 of the Dutch edition.

* Strictly speaking the Aramaeans or Syrians of the Bible.—EDITOR.

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Hrozny[6]—who cannot possibly be suspected of racist prejudice—in the following words:

> The Hurrians were dominated by a minority of the Aryan, "Indian" Mitannu people. Under the leadership of these aggressive conquerors the Hurrians took possession of the neighbouring territories. As has already been shown the mysterious Hyksos are probably only the Hurrians of Northern Mesopotamia. Led by the Aryan Mitannu nobility and using light, two-wheeled war chariots, they subdued not only Northern Mesopotamia, Assyria, Palestine, and a considerable part of the Hittite Asia Minor, but also Egypt, and probably also Crete and certain regions of Greece, as will be shown later.

Enough has been said to demonstrate that the Aryan expansion, which made itself felt at the same time in northern Africa and the Near East as in Central Asia and eventually even in China, was an event of world-wide significance. It was made possible by the fact that the Aryans took over from the Babylonians the war chariot, improved it by furnishing it with spoked wheels (instead of disc wheels) and had it drawn by horses instead of by asses.

In north Syria and north-western Mesopotamia—the starting-point of their conquests—there existed from the beginning of the sixteenth century the kingdom of the Mitannu, which played the rôle of a great power until the year 1370 B.C. when it was destroyed by the Hittites. The Mitannu called themselves *Harri-ya, i.e.*, Aryans, worshipped Indian gods such as Indra, Mithra and Varuna, and spoke a language which was intimately akin to Sanskrit.

For Palestine, situated as it was in the centre of their empire, the rule of the Hyksos was a period of prosperity and material progress, during which the land was densely populated. But at the same time the linguistic and racial composition of the poulation had become more complex. Besides Semitic and Aryan, Alarodian (Caucasian) languages were also spoken, and the skeletons unearthed at Megiddo, which date from this period, prove that the round-headed Armenoid type of the Hurrians was amply represented.

In course of time the empire of the Hyksos disintegrated, partly as a consequence of its feudal structure. The local princes made themselves almost independent and their many feuds and armed conflicts are reflected in the repeated destruction of the Palestinian towns. Ultimately these dissensions led to the liberation of Egypt and the fall of the Hyksos Empire (1580 B.C.).

In Palestine the internal unrest continued during the following

[6] B. Hrozny, *Ancient History of Western Asia, India and Crete*, Prague, p. 127.

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period of Egyptian domination (*c.* 1550-1227 B.C.) when many uprisings took place which were every time followed by Egyptian punitive expeditions. From this period date the Tell-Amarna letters, in some of which Egyptian governors or vassal-princes inform the Pharaoh of incursions of the nomadic Khabiri, the Hebrew of the Old Testament. Of the non-Egyptian personal names—mostly names of vassal-princes—which occur in these letters, nearly two-thirds are Semitic, while the rest are almost wholly Indo-Iranian. From the latter it can be deduced that Indian gods, such as the storm-god Indra, Yamin, and the sun-god Surya, were also venerated in Palestine. However, the name of Abu-Kheba, prince of Jerusalem, which is derived from the name of the Hurrian head-goddess Kheba, is Alarodian.

Presumably it was in this period that the Phœnicians, who called themselves—at any rate in later times—Canaanites, were semiticised in language and culture. The origin of this seafaring and trading people has been the object of much controversy among scientists. The French orientalist C. Autran has pointed to the improbability that groups of Semitic nomads, on reaching the Mediterranean coast, should have metamorphosed into a seafaring people. He drew attention to the fact that in the environment of the Aegean Sea—generally considered as the scene of the earliest Phœnician colonisation—traces of Semitic culture and language are wanting. In his opinion the forbears of the Phœnicians were natives of Caria in Asia Minor who colonised the Syrian coast at an early date. Their homeland originally bore the name of *Phoinikè*, which was then used for the coastlands of the Aegean generally and ultimately became the name of the coastal strip of Syria.

The last argument is strengthened by his compatriot R. Weill, who observes that the history of the use of the Egyptian word *Kefto* runs wholly parallel. Originally, during the New Empire (after 1580 B.C.), this name denoted the island of Crete, but it was also used for the coastlands of the Aegean and the Mediterranean generally; ultimately, under the Ptolemies, it became the name for the Syrian coastland only. Not very different is the view of the German orientalist O. Eissfeldt, who thinks that the Mycenaean and Cypriot pottery dug up at Tell-el-Hesi (ancient Eylon) and other places in Palestine and dating from after 1400 B.C.—that is, from after the fall of the Cretan sea-power—hints possibly at a Carian immigration.

Be that as it may, it seems unlikely that Semitic nomads ever settled in considerable numbers in the narrow, rocky and densely populated coastal strip of Syria, which could not have been attractive to them. Presumably the autochthonous population of this coastland had maintained themselves during the Canaanitic invasion, and in spite of many admixtures remained thereafter

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mainly Mediterranean in racial character although adopting the Semitic speech of the Syrian hinterland.[7]

The Egyptian rule over Syria and Palestine was shaken in the fourteenth century when Egypt became confronted with the expanding might of the Hittite Empire. In the great battle of Kadesh (1293 B.C.) the Hittite king Muwatallis was supported by a horde of Khabiri, and there is little doubt that another group of Hebrews, the Israelites, made use of the weakening of the Egyptian domination which resulted from the defeat of Rameses II to invade Transjordania, there to destroy the Amoritic principalities of Sihon, the "king" of Hesbon and Og, the ruler of Basan. Their inroad formed the prelude to the second swarming off of the Semites, the so-called Aramaic invasion, named after the Aramaeans who invaded Syria at the same time and of whom the Hebrews were an offshoot.

In Canaan (*Kinakhoe* or *Kinahnoe* in the Amarna letters)—the name that had come into use for the western part of Palestine—the Egyptian overlordship ended when the first attack of the so-called Peoples of the Sea on Egypt (in 1227 B.C.) compelled Pharaoh Merneptah to withdraw the Egyptian garrisons from this occupied country. This was followed before long (in 1225?) by the inroad of the Israelites under Joshua and the partial occupation of the hill country of Western Palestine by these Hebrew tribes. It is very possible that another of these tribes which had remained since the time of the Hyksos in Goshan, a region bordering on the delta of the Nile, where it lived in serfdom, used this favourable conjunction to escape into the steppeland of Sinai.

The second attack of the Peoples of the Sea on Egypt which followed in 1193 B.C., during the reign of Rameses III, brought a last addition to the already so heterogeneous population of Palestine. After their defeat in the battle of Migdol, one of these peoples, the Poelista or Philistines, settled in the southern part of the coastal plain, the so-called Shefela. This people, which originated in all probability from Crete, was mostly of Mediterranean stock,* although it was headed by a Nordic aristocracy of Achaean descent. The Tji-kall, a little known people who became their northern neighbours in the plain of Sharon, were probably of the same stock.

[7] In the text I have left out of consideration another hypothesis of Autran, expounded in one of his later works, in which he ascribes to the Phœnicians a Dravidian origin, oddly enough without any reference to his previous view. Although the existence of Dravidian splinter-groups in ancient Mesopotamia cannot be denied, and they possibly also existed in Asia Minor (the Tramila in Lycia), it is by no means sure that they testify to an early Dravidian colonisation. In my opinion they are rather to be considered as remnant groups. *Cf. Mithra, Zoroastre et la préhistoire aryenne du Christianisme* by C. Autran, Paris, 1935, pp. 56-86.

* There is reason to assume that they also had some Atlantic elements.—EDITOR.

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There can be little doubt that the invasions of the Israelites and the Philistines greatly stimulated the overseas colonisation of the Phœnicians in the coastlands of the western Mediterranean. It cannot be an accident that *Gadir* (Gades)—the oldest name of which, *Jebusei*, is Canaanitic (*cf. Jebus*, Jerusalem)—was founded about the same time (1100 B.C.), while Canaanites who had been expelled from their homeland by Joshua settled, according to Mediaeval sources,[8] on the Balearics and the North African coast. This makes it clear that the invasions of these peoples into Palestine had far-reaching repercussions.

[8] *Cf.* Karst (1931), pp. 39-40; and Maspero (1917), pp. 372-375.

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Book Reviews

THE CHALLENGE OF COLOR: A STUDY OF THE RACE PROBLEM

By Alfred Drew. Federation for Constitutional Government, New Orleans, 1965. Pp. 134. Price $1.00.

The author opens with a chapter on the reason for the collapse of the Egyptian civilisation, in the course of which he makes the point that the Egyptians were Mediterraneans and were certainly not Negroid. It would have seemed incomprehensible some years ago that anyone should need to stress this at all, since such a veiw could not then—and cannot now—be challenged by anyone who knows anything of ancient history and anthropology. In fact, this has become necessary since the advent of the high powered propaganda which is being disseminated in many directions to suggest that the Egyptians were Negroid or in some respects mixed with the Black stocks. Nothing, of course, is further from the truth. Such Melanoid—and especially Negroid—peoples or elements that found their way into Egypt were slaves, and made little or no contribution either culturally or genetically to the dominant stocks.

Drew tends to confuse the Nubians and Ethiopians with the Negroids, but they are quite distinct. The Nubians, who formed the earliest Black contact for the White Egyptians and became their slave class (just as they are now largely a servant class), were probably derived from an Australoid rather than Negroid element in which there was probably a Caucasoid admixture, so that in racial type they were in fact not far from the Cushitic peoples. The Ethopians also have such a Cushitic basis, and a further Caucasoid infusion of Semitic origin is found in their ruling classes.

The general argument in this part of the book is that the downfall of Egypt was due to Negro infiltration. However, this needs some qualification. First of all it is doubtful whether the Egyptian inscriptions relating to defence against Negro immigration in fact referred to the Negroids at all. More probably they meant the Black peoples to their south who were in fact not Negro. Secondly, although a Cushitic infiltration occurred—as the natural outcome of the Egyptian conquest of Nubian territories—and some Negroids were introduced as slaves, this did not materially change the racial character of the Egyptian ruling classes.

There is a great danger in reading into historical ethnological terms our present meaning of them. For instance, the author quotes a royal inscription in which the Egyptian ruler said that, as a consequence of having to pay tribute to the King of the Hyksos, he sat "associated with an Asiatic and a Negro." Now the Hyksos were probably Nordics or Nordo-Dinarics, so they would have been far from what we would imagine by the use of the term Asiatic; and probably the term translated here as Negro does not in fact mean Negro at all but Cushitic.

Where racial frontiers occur some infiltration obviously takes place, but this could only have been into the lower orders of ancient Egypt, since the Copts—who are the present descendants of the ancient Egyptians—are mainly Nordo-Dinaric-Mediterranean in type, and this must represent what was once the ancient Egyptian type at the end of the pre-Islamic civilisation.

Although Drew's over-Negroid emphasis needs to be corrected we should not minimise the seriousness of his thesis that racial miscegenation can—and often does—lead to ethnic collapse. In the case of ancient

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Egypt any intermixture from the south could hardly have helped the cultural and genetic inheritance of the Egyptians—and coupled with genetic loss of some of the abler elements it would largely account for the collapse of this gifted people.

Besides Egypt, however, *The Challenge of Color* deals with far wider subjects and implications, including racial mixture in Latin America and the problems facing the United States today, and the relationship of these matters to Russia. Towards the end of the book the author discusses the possibility of resettling Negroes from the United States in Africa.

Drew's emphasis upon the "separate but equal" doctrine—as against the concept of absolute equality based upon the destruction of separation —strikes a note of realism.

DAILY LIFE IN GREECE AT THE TIME OF PERICLES

By Robert Flacelière. Translated from the French by Peter Green. Weidenfeld and Nicolson, London, 1965. Pp. 310, 39 plates, 2 maps. Price 42s.

This is an account of Athens in the fifth century according to the reconstruction of a distinguished French scholar, and it is a most penetrating one. Anyone wishing to understand the way the Athenian lived, and what were his standards in the trades and professions, will find this book a a necessity. One point the author makes in his Preface is (what we would today call) the racialism of the Greeks, who thought of themselves as a stock different from the rest of Barbarism.

ORIGINS OF MAN

By John Buettner-Janusch. John Wiley and Sons, New York, 1966. Pp. 674. Price $9.45.

This book is an introduction to physical anthropology, containing much up to date and valuable information. Written from the populationist point of view, the book covers a wide range of topics including human evolution, human genetics, primatology and serology.

The author advocates the "lumper's" taxonomy for the fossil and living primates. He would place all the fossils known as australopithecines in a single species, *Homo africanus*. Other authorities have divided the australopithecines into two species, *africanus* and *robustus*, the latter species being more massive and rugged. To support his view the author points out that variation equivalent to that found in the australopithecines can be found in living chimpanzees, all members of a single species. He places the australopithecines in the genus *Homo*, rather than in a separate genus, *Australopithecus*, since he considers it unlikely that two genera of hominids could have coexisted. He would place the pithecanthropines, Neanderthals, and other Middle and Upper Pleistocene fossils in a single species, *Homo sapiens*. The author is more than justified in criticizing the practice of anthropologists of creating separate species, and at times genera, for a single fossil. However, the variation within the group the author terms *Homo sapiens* appears to be great enough to warrant two species, *Homo erectus* and *Homo sapiens*.

The book contains a detailed discussion of biochemical variation in man and the other primates. All of the blood group systems, the variant hemo-

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globins and haptoglobins are dealt with. The chapter on natural selection and blood groups is of particular interest. The chapters on evolution and genetic equilibrium and on the chemical and structural basis of heredity are also excellent. The subjects are explained clearly and in more depth than they are in most books on physical anthropology.

The author states that races definitely exist. However, he considers the study of gene frequencies to be far more important than racial studies based on morphological criteria. It is the reviewer's opinion that much can be gained from both the genetic and the morphological approaches, and that they complement, rather than contradict, each other. However, no disagreement over minor points can detract from this informative and well written book.

FRANK MIELE.

MALTA AND GOZO

By Robin Bryans. Faber and Faber, London, 1966. Pp. 256, 28 plates. Price 42s.

This is a book for popular reading in which Robin Bryans brings out the fact that the Maltese archipelago has more interest for its size than probably any other similar region. He mentions the prehistoric Neolithic settlers, and goes on to deal with the Phoenicians, Greeks, Romans, Arabs, Normans and, ultimately, the Knights of Malta, and the French and British—as well as matters of more tourist interest.

It makes good reading, and is the sort of general introduction needed for the understanding of deeper archaeological and ethnological study.

It is interesting to remember that the Maltese speak the Phœnician language, related to Hebrew and Arabic; a language which gave us the alphabet.

EVERYDAY LIFE IN BABYLONIA AND ASSYRIA

By H. W. F. Saggs. B. T. Batsford, London: G. P. Putnam's Sons, New York, 1965. Pp. 207, 115 illustrations. Price 21s.

This is an excellent account of life in this early part of the White world. The author gives a brief but useful account of the races of Babylonia and Assyria. He places the coming of the Sumerians at over 5000 years ago. They came from the east or north-east and developed their civilisation on the basis of an indigenous people living in villages, some of whom may have been Semites.

The Sumerian social structure consisted of the nobles, the freemen, the dependent freemen, and the slaves derived from prisoners of war.

Dr Saggs provides the ethno-historical background of Mesopotamia and Babylonia, and gives an account of the birth of writing about 3000 B.C. in Sumer. He mentions the possibility that these pictographic characters may have been preceded by early forms—which would push back the beginning of writing to an earlier date. His account shows how pictographs were also used for syllograms, in the development of a syllabary, and very soon the pictographs themselves developed into ideograms. By about 2000 B.C. syllabic cuneiform was coming into general use.

As early as this time of the beginning of writing the Sumerians had already devised symbols for their numerals. They had a decimal and also

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a sexagesimal system—that is arithmetic based on 10 and 60 respectively. Quite early could they calculate square and cube roots, and solve quadatric equations.

All this indicates the gulf in development between these Caucasoid peoples and the primitive stocks discovered by the Europeans from the fifteenth century onwards who had never reached anywhere near these standards of knowledge. On these grounds at least we have a known difference of development of 5000 years—but the distance in time between the Caucasoids and the Melanoids might, indeed, have been very many times this.

LIFE IN NORMAN ENGLAND

By O. G. Tomkeieff. B. T. Batsford, London: G. P. Putnam's Sons, New York, 1966. Pp. 178, 169 illustrations. Price 21s.

With the accession of Edward the Confessor in 1042 Norman influence became important in England, and it reached its culmination when the Normans conquered the English in 1066. Mrs Tomkeieff considers the Norman period to have lasted on till the loss of the Duchy of Normandy in 1204 by John Lackland. This book sets out to give an account of Norman influence on the English social order.

The authoress attributes the anglicisation of the Norman aristocracy of England to the action of Philip II of France who refused to accept as tenants any who held land in England. No longer could nobles hold land in both realms, and they had to decide whether they were to be French or English. This marked the beginning of the division of Norman families into their French and English halves.

Life in Norman England is remarkably well illustrated and provides very interesting reading.

DYSTONIA MUSCULORUM DEFORMANS: A GENETIC AND CLINICAL POPULATION STUDY OF 121 CASES

By Tage Larsson and Torsten Sjögren, with the assistance of Göta Sjögren. Supplement to *Acta Neurologica Scandinavica*. Munksgaard, Copenhagen, 1966. Pp. 232, 30 tables, 8 figures, 1 pedigree chart.

This monograph is the result of a genetic and clinical population study of 121 cases in rural Sweden which was carried out as part of a research programme on the epidemiology and genetics of mental and neurological diseases in Sweden under the direction of Professor Torsten Sjögren and sponsored by the Institute for Medical Genetics of the University of Uppsala.

These studies of dystonia musculorum deformans, based upon genealogical, geographical and genetic analysis, proved that the disease is conditioned by a unitary single-gene mutation, the mode of inheritance being autosomal monohybrid dominant. In concluding their investigation the authors say (pp. 188-189):

> The findings from the present series are quite in accordance with general knowledge of the action of genes and with the results from studies of other neuropsychiatric diseases which are conditioned by

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dominant single-gene mutations compatible with reproduction, *viz.* a comparatively late onset and great variability in the symptom picture—though, on the other hand, there is often an almost "photographic" similarity between groups of patients (in particular between afflicted sibs).

This pattern speaks decidedly in favour of a theory that the effects of the conditioning gene are modified chiefly by the action of genes (and to a minor extent only by environmental factors); this modifying gene effect may be assumed to be mainly multifactorial.

The work of Professor Sjögren and his colleagues has already established very considerable genetic material on the inheritance of the pre-disposing causes of a wider range of such conditions. This study is highly significant and a very great contribution to our knowledge of inheritance.

R. GAYRE OF GAYRE.

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